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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE PRINCE CONSORT NATIONAL MEMORIAL.

THE gorgeous National Memorial to the Prince Consort has, as far as the structure and its appurtenances are concerned, been at last brought to a state of completion. It stands, however, at present, and is likely to stand for some time to come, as a rich shrine ready to receive, but still lacking, the very statue as a covering for which it was designed. Mr. Foley's illness, and the anxiety which all must share that no undue hurry should in the least degree detract from the merit of this work of his, which is to crown the whole, is sufficient reason for giving up to the nation the monument as it is. We should not now refer to the absence of this statue were it not absolutely necessary to bear it in mind in judging of the general effect, and for this purpose alone shall we again refer to it.

If brilliant sunshine be, as has been suggested, the proper accompaniment of such delicate materials and elaborate workmanship as have been so lavishly employed in the building up of this labour of love and homage to the deceased Prince's memory, even Italy could not have been a more favourable site for it than our own lovely Park proved upon the auspicious occasion of the inauguration of this portion of the undertaking. Nay, the tender grays melting into fleecy white of the clouds which then partially veiled the blue sky proved the most exquisite background that could be conceived for its jewelled filigree, and the deep azure which gleamed liberally through the rents in them gave just the contrast to its profuse gilding that it needs.

We do not feel disposed, under the circumstances, to scan too curiously, or in a hypercritical spirit, this truly magnificent trophy of the associated arts, and we rejoice that such an opportunity has been afforded by its means to our artists to show what was in them, for even if their shortcomings be numerous, yet an example has been set that is likely to lead to other attempts of the same kind, and the experience gained in this will, without doubt, be most useful. In many respects the monument is an experiment, the complete success or partial failure of which cannot fail to be of great practical value, and no one can deny to its architect, Mr. Gilbert Scott (soon, we suppose, to become *Sir* Gilbert), the merit of boldness in so trusting to the generally humid atmosphere of England, and the particularly corroding one of its metropolis, such a combination of different metals and marbles as have hitherto been deemed quite unsuitable to it. Whether or no—though all iron, as much as might be, has been buried out of sight, protected by bronze, bell metal, &c.—rust and its potent assistant, galvanic action, may be defied, and whether or not, therefore, that admirable quality of boldness has been in this case overstrained, time alone can show.

At the same time, however, that we would view this superb monument, as the motives which have given birth to it, in the most favourable light, yet we cannot but resent the deprecation of all criticism with which most of the laudatory notices which have appeared of it have been accompanied, with the view, as it would seem, of silencing any opposition to the statements made as to its perfection, which the writers evidently feared could not stand upon the merits of their descriptions alone. Our joining, or refraining from joining, in the unqualified strain of praise which has become almost wearisome, if not fulsome, from its monotony and repetition, will not alter the verdict which will be in the end accepted as just, and it is this that to the best of our power we would wish now to anticipate.

Taking Mr. Scott's published description of his design, we find that his conception of the memorial was "a vast and magnificent shrine or tabernacle, covering a colossal statue of the Prince, surrounded by works of sculpture illustrating those arts and sciences which he fostered, and the great undertakings which he originated." His method of carrying out this idea he describes to have been by elevating the monument upon a lofty and wide-spreading pyramid of steps, from the upper platform of which a podium, or continuous pedestal, surrounded by sculptures in alto relievo, forms the foundation of the monument, and placing upon this the shrine or tabernacle itself. We accept, then, this as his idea, setting aside the question as to whether any other would have been preferable, or that as to whether some more solid and, perhaps, sober construction would have been more suited to the purpose and position. A splendid baldacchino we are told we have got, the first notion of which was taken from those that stand in Italian churches. Whether this translation from an internal to an external monument was the most judicious choice that could have been made, we pass over in acknowledging that such was the architect's decision, and as such we are, therefore, content to regard it. A necessary result, however, of the selection of this type is that, as a baldacchino, it stands clear in the open air without the character of background for which those articles of ecclesiastical furniture were specially designed and suited, and while this stupendous development of their idea might have towered up harmoniously, as the completion of a vista, to the apex of the vaulting of some gigantic cathedral, and could never have been taken infelicitously in flank, it is now from a distant point of view rendered comparatively insignificant and even flimsy beneath the great vault of heaven, is dwarfed by the huge mass of the Albert Hall, and competes with difficulty in its aspiring lines with the surrounding trees of the Park, which form from most points of view the foreground.

When reference is made to the Scaliger tombs at Verona as a ground whereon to form a comparison, it is unfortunate, for in their confined court abutting upon a narrow street in a crowded city they are exposed to no distant gaze, nor, indeed, to any such competition. Were they to be so, we must aver that they would come out better from the contest: their material, marble, having permitted of the requisite greater solidity, their forms being simpler, and their outlines better. The graceful Eleanor Crosses, raised by our Edward I. to the memory of his Queen, have not been without their influence upon this work, and it might be said that the design is a combination of the two ideas, and that it consists of the imitation of an Eleanor Cross set upon the top of an baldacchino, and it is in the want of perfect fusion between these types that the greatest fault of the Prince Consort Memorial consists.

Judging it, again, from a considerable distance, and directly in front—the best position at such a distance—the spire corresponds to the Eleanor Cross, but does not rise at all gracefully from the gabled roof of the substructure, or baldacchino, the continuity of the pyramidal outline being broken, and part of the spire seeming to have slipped down and become buried. Taken at the angle, from a like distance, and as generally seen from various parts of the Park, the dissonance between these two portions of the monument is painfully increased, and we are obliged, then, to pronounce its outline ugly.

Looking, again, at the spire alone, we regret not to be able to speak favourably either of its general outline or form, for its metal construction causes it to be too contracted between the several groups of figures, and there it looks weak. This is just the point where the translation of the well-known type of Eleanor Cross from stone to metal must be to the disadvantage of the latter. Again, in the principal stage of this spire, some unfortunate distortion of the openings through which the light appears makes the groups of supporting columns at the angles appear to lean outwards most alarmingly. On approaching the monument these defects diminish, and near the base all awkwardness from the angular point of view ceases, and the outline becomes pyramidal. The elaborate richness of the detail then becomes apparent, and prevents further cavilling at matters which do injuriously affect the outline and proportions at a greater distance, such as the somewhat excessive size of the surmounting cross, and the ball and finial below it.

This flêche or spire, we are told, is supported by two wrought-iron box girders, placed diagonally and united in the form of a cross, and these in reality tie together the groups of shafts at the angles. This is an ingenious application of modern engineering appliances, but we can hardly allow of science. By this means the arches, were they arches at all in a constructive sense, would have their thrust counteracted, but the means being hidden, the result would even then be unsatisfactory. As it is, these apparent arches are but hollow boxes in an arched form, and neither contribute to nor detract from the stability of the structure. We do not wish to dwell upon this false construction, but as the amateur panegyrists of the press have noticed it only to gloss it over, we feel it a duty emphatically to state that it is contrary to all canons of art, and will, we are sure, not meet with approval hereafter, and we sincerely hope will not be taken as a model for imitation. The main or baldacchino portion of the Memorial consists of the four groups of shafts forming the angle piers, which are of varied polished granites with gilt stone capitals; these bear the square superstructure with its four arched-shaped openings and spandrels decorated with mosaics, and pediments on each side with intersecting roofs; but the whole of this structure is, like the arches, a hollow boxing of metal, richly studded with applied ornamentation, which must be said to be over-florid, for not an inch of space is left for repose, and the fringe of floriated crocketting to the pediments is in spirit what Mr. Ruskin has described as *Flamboyant*, although the type chosen for the individual details is Early Conventional. The excellent workmanship of this is due to Mr. Skidmore, of Coventry, whose work is very admirable in its place; but we cannot think it quite in place when superseding, as here, the structure founded on masonry which it represents. Had an enthusiastic leather merchant, like him of old, been consulted, no doubt he could have produced as good, and possibly as durable, an imitation of architecture in leather as Mr. Skidmore has in metal, and, in our own opinion, it would have been equally justifiable.

All the superstructure above the podium is in coloured material, or richly gilt and illuminated, so as to resemble a gigantic Mediæval reliquary. In effect, we consider this harmonious, and not garish, as some have asserted, and it is certain that the gilding will be still more subdued before long. Considering, however, its construction, size, and position, the filigree character it affects, we must say, does lay it open to the charge that its amateur admirers have almost admitted, while deprecating it, of being allied to the "gingerbread" type of decoration. As we have said, however, we will not intrude remarks upon what might have been, and will strive as children to enjoy the glitter that has been given to us, lest we be thought too hard to please. Among these pretty things are the mosaics by Messrs. Salviati, from designs by Messrs. Clayton & Bell. In each tympanum is an allegorical figure—representing one of the fine arts of Poetry, Painting, Architecture, and Sculpture—seated on a throne, well drawn and draped, and interesting when viewed near, but not very effective at a distance.

Descending in order we come to the podium or stylobate, with base and cornice moulds of polished red granite from the Isle of Mull, and a belt of sculpture between in white marble. Two sides of this are occupied by an interesting series of figures of poets, musicians, and painters, by Mr. H. H. Armistead, and of architects and sculptors by Mr. J. B. Philip. They are picturesquely arranged, and will be popular, but will not bear close inspection, or satisfy professional critics. We confine ourselves to the consideration of the Memorial from an architectural point of view, and the main want we feel is for repose in this as in other portions, and should have liked the projecting angular masses to have been left plain. The four upper groups representing, Agriculture, Manufactures, Commerce, and Engineering, by W. Calder Marshall, R.A., Henry Weekes, R.A., Thomas Thorneycroft, and John Lawlor, are of a higher class of executive art, and being generally well grouped, contribute much to the beauty of the whole.

The four lower groups also—representing Europe, Asia, Africa, and America, by Patrick Macdowell, R.A., John Henry Foley, R.A., William Theed, and John Bell—are striking, and generally excellent from all points. But we must leave their more critical description to other hands, and again consider their treatment merely from our special view. According to this we are sorry again to have to take grave exception in that the combination of colouring of all the lower part of the monument is cold and poor. As we have described it, the upper part is rich in colour and comparatively dark in tone, while the widespreading basement upon which it stands is composed of pale gray granite steps, and upon these white groups of sculpture. From the podium (with its broad band of white between two strips of red) downwards all is of aërial, and apparently unsubstantial colouring, and the whole consequently looks top-heavy. The figures of the angels in bronze just above appear like negroes by the contrast, and this brings us again to the consideration of the missing figure of the Prince. If this be, as intended, a sitting figure in bronze, we confidently predict that the general effect will be completely spoiled—whereas, if it be erect and in white marble, it would almost restore the harmony now wanting. Both in outline and in colour it will form the culminating point of a pyramid of sculpture, and the eye will follow from the lower groups to the podium, then to the upper groups, and thence seek an object not less aspiring in form and equally brilliant in colour, or rather absence of colour, than the rest. This will be independent of the baldacchino and its adjuncts, which, again, will form another loftier pyramid above, in itself harmonious and united in its quite different scale of polychromy. But if a depressed seated figure in dingy bronze form the apex of this lower grouping, we have no doubt but that the result will be disastrous. After such a vast expenditure, and the completion in so satisfactory a manner, on the whole, of this sumptuous shrine, it would be well to give this question as to what is to be placed in it full consideration while there is time.

In conclusion, we have no hesitation in endorsing the opinion that this Prince Consort's Memorial is quite worthy of the age, and, indeed, an excellent embodiment of its specialities, which do not include great originality, or a very high class of art, but good eclectic imitation and great ingenuity, to which in this case has been added unusual liberality in outlay.

SIR RICHARD WALLACE'S COLLECTION AT THE BETHNAL-GREEN MUSEUM.

THE East-end of London, and, in fact, all the metropolis, owes a deep debt of gratitude to Sir Richard Wallace for the princely liberality with which he has, entirely at his own cost and under his own personal supervision, transferred all his matchless collection of paintings and other works of art, which were formerly the property of the late Marquis of Hertford, to the new Museum, which was opened on June 24. These splendid and interesting works occupy the whole of the galleries at the top of the building, and furnish a display of the finest art, unrivalled by any private collection. The exhibition includes first-class examples of almost all the schools, but is richest in those which are either absent altogether or imperfectly represented in our national collections, and so is more than usually instructive and interesting.

Some idea of the importance of the exhibition may be gained from the number of pictures, not one, as far as we have been able to examine, being of doubtful authenticity. There are no less than 680—the entire number of articles in the catalogue being 1,779. Among them are seven Berghems, seventeen Canalettos, eleven Albert Cuyps, ten Guardis, five Hobbemas, six Metzus, nine William Mienis, eleven Murillos, many of the highest quality; eleven Rembrandts, of extraordinary magnificence; eleven Rubens, including the superb "Rainbow Landscape;" four by Jan Steen; five by D. Teniers the younger, six Vandykes, six Van de Neevs; beautiful examples of both Adrian and William Vandervelde, there being no less than eight paintings by the latter; eight by Velasquez, and among them a careful and excellent sketch of the great "Boar Hunt." There are also ten examples by T. Weenix, and eight by T. B. Weenix. There are also several pictures by Peter and Philip Wouvermans. Besides this there are one or two pictures by most of the best artists; but with all these riches in the older school, there is a still more extensive and remarkable exhibition of more recent, and especially of French, pictures.

By Greuze there are twenty-two paintings, all as fine as possible, and showing a variety which few persons in this country were aware of. The amazing beauty of the twelve Meissoniers must be seen to be appreciated. The other French artists most numerously represented are Decamps, Delaroche, Laneret, and Vernet. Among the pictures of the English school are some of the very finest productions of Sir Joshua Reynolds's hand, thirteen in all, including "The Strawberry Girl," and "Nelly O'Brien," the celebrated beauty. One cannot help regretting, when looking at this charming portrait, that the colours should have so faded; beautiful as it is now, it must have been quite wonderful when the tints were fresh. There are also some by David Roberts, a fine Sydney Cooper, and last, but by no means least, are the most important works of R. P. Bonington, whose death at the early age of twenty-seven is so much to be deplored; as a colourist, he has not been surpassed by any of our countrymen. As has been the case also with other first-rate colourists, he was as skilful in water-colour as in oil.

Though the Italian schools are not shown in such abundance as those of other countries, still there are some fine single pictures. No. 258 is a good and very instructive "Holy Family," by Leonardo da Vinci, which gives a good opportunity of comparing him with his pupil, or at any rate imitator, Luini (262), much of whose work is so like Da Vinci's that it requires a first-rate judge of the master to decide. In the present instance there is rather a marked difference between the two—the Da Vinci being much more refined in treatment, as well as quieter in tone. No. 265, a figure of S. Catherine of Alexandria, by Baptiste Cima di Corregliano, is full of dignity, and excellently finished. It is probably one of a series. There are no less than three by Sassoferrato, all good specimens of his peculiar love of strongly-contrasted colour. The best is (259) "Virgin and Child." The holy babe is sleeping, while the blessed mother watches him with thoughtful loving awe. There is much more feeling and force in this picture than in most by the same master. By Domenichino (252) there is a fine head of a woman, strongly resembling the Cumæan Sibyl at Florence, showing great intensity of colour. Of Italian portraits there are but two—one of the school of Raphael, and the other a very charming one of a lady by Bronzino (268), almost equal to the famous one at Oxford. It is a full face; the details of dress are faultless. Lest the young lady should think too much of herself the artist has inscribed it "Fallax gratia et vana est nuldevitudo." One of the best of the Italian paintings is (263) "Venus disarming Love." The Cupid is admirable. The way the little rascal is painted, half laughing, half entreating, is inimitable; but we much doubt if it is Venus. The richness of colouring much resembles Titian, and is produced in a somewhat similar way, though with a heavier, rougher hand. No. 253 is a choice and refined little bit by Albano. The collection also contains a good Andrea Del Sarto, and a splendid landscape by Salvator Rosa, from Lord Ashburnham's collection (269). The display of works of

Canaletto and Guardi, mostly views of Venice and of very equal excellence, is too extensive to permit particular notice. The panoramic view of Venice (256) is perhaps the most wonderful. It has seldom been possible to compare so many good examples of these two Venetians. Guardi will bear the comparison well, though he does not in a single instance come up to the extraordinary brightness and sharpness of his master. (Guardi left to the imagination what Canaletto *did.*) Still, in other respects, he is certainly superior, especially in the lightness and delicacy of touch.

Of the finest Spanish work there is abundance, more especially of the pictures of Murillo and Velasquez. The finest of them are arranged together so as to give an opportunity of studying the masters' work in its various phases. The peculiar richness and harmony of colouring is most striking. For amazing richness and depth of colour nothing comes up to (302) "A Virgin and Child," two beautiful portraits. It is most noticeable how much this artist excelled when portraying the actual life that he saw about him, and so by far the most satisfactory picture in the series is (305) "The Charity of S. Thomas de Villanueva." This is an excellent representation of Spanish life, with its beggars and monks. The little fellow who has probably for the first time in his life got a piece of silver is exceptionally clever. By Velasquez there are several good portraits with all his usual dash and power.

When we come to the Dutch and Flemish schools, we are quite bewildered by the amazing quantity and variety. We have seldom seen such pleasing and perfect pictures by M. Hobbema as appear in these galleries. Their truth is marvellous. No. 76 is particularly interesting, being his diploma picture, painted upon the occasion of his reception into the Royal Academy of Amsterdam. No. 141 is also a beautiful specimen, but for truth and excellence none is superior to a somewhat unusual one, (200) "The Outskirts of a Wood." Jacob Ruysdael's landscapes are also fine examples, especially (80) "Landscape with Waterfall," and (198) a beautiful calm gray landscape, which may well be compared to Hobbema's (200), which hangs close to it. This power of comparing the styles and excellences of the greatest masters is one of the most pleasant and instructive points in this large assemblage. The grandest landscape of all is undoubtedly the "Rainbow" one by Rubens. This giant painter himself seldom produced so powerful a representation of scenery. On a much smaller scale, but of superlative excellence, are the many beautiful moonlight and other scenes by A. Vandeneer. No. 98 is one of the best and most interesting, being so much higher coloured than is usual with him; but nothing by this painter is more exquisite than a tiny bit (217), "A River Scene." This little gem is of the highest possible quality. There is a full display of the works of A. Cuyp—one of the most characteristic, though a small one, being an avenue near Dort: the distant view of the city is charming. By L. Bachhuyzen there is only one picture (246), but it is a fine example. W. Vandervelde, on the other hand, is fully represented. No. 195 is a magnificent specimen of his larger style. Before passing from this part of the collection we must not omit to notice, also, a good landscape by Rembrandt (199), full of powerful delineation. In portraying great extent of flat country no one has ever surpassed him.

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FINE ART AT THE INTERNATIONAL EXHIBITION.

ENGLISH OIL PAINTINGS.—CONCLUDED.

The pictures which we have described at some length deserved that notice as being typical pictures; there is little in the galleries which goes beyond them or travels into very different regions. The central positions in the southern gallery are occupied by a second large picture of Frith and one by Elmore. Mr. Frith, in his "Charles the Second's Last Sunday" (455), repeats many of the peculiarities of his "Railway Station," but while the set air of many of his figures suits the period and the subject better than it fits with a scene of contemporary life and bustle, there is that about the whole which prevents it from rising to the dignity or gravity of historical painting—it is, after all, but a very fine incident picture, of which the scene is laid in by-gone days. Mr. Elmore in "The Tuileries" (343) rises no higher than Frith, save in the dignity which he has managed to infuse into the figure of Marie Antoinette; he paints an episode which has in it the material for a picture of the utmost power, but he has not the ability to go beyond clever and very unideal and common-place realism, and that, too, in a style which Mr. Ward has made his own. Hanging near Elmore's work are Landseer's two studies of lions (339, 346) far better seen here than they were in the Academy, and serving to remind the observer that a complete walk of art has been created in our own day by a painter of whose powers we have all learned to be proud.

In two other walks English painters have made their school famous. We look for successors to Gainsborough and Reynolds as portrait painters, and again, to Gainsborough with Turner as the founders of English landscape; and though we find nothing reaching the level attained by those great artists, we shall have to notice enough good specimens of portraiture and of landscape to remind us that in these two walks, as well as in the painting of animals, of incident, and of poetical subjects, our school is still healthy and active. It is only when we come to the highest branches of the painter's art that we find it quite at fault. This exhibition contains no great picture of a historical or a scripture subject, though the present age boasts of one or two English painters capable of producing one.

We turn now to the general contents of the rooms, and we shall pass altogether unnoticed that vast mass of pictures, which barely reach the level of respectable mediocrity, if even they rise so high. It is painful to see such evidence of moderate or inferior cultivation of powers which, better trained, might have in some cases at least produced works of merit.

Commencing with Room No. 6, the first picture which catches the eye is one that fairly startles the beholder. Mr. Spencer Stanhope's "Juliet" (28) is a work with the stiffness of Leys, but without his genius, though forcible and quaint enough to deserve notice. Near it hangs a good specimen, though a small one, of the antiquarian learning and painter-like skill of Alma Tadéma (31), which may well rebuke much of the uncouthness of Mr. Stanhope. Mr. Cole, in his "Wheat Harvest" (32), though he does not rise to his highest power, gives us a great stretch of truly English scenery, faithful in colour, perhaps rather hastily painted, but with that air of mystery and distance in the background which gives a touch of poetry to the work, and so raises it from the level of a study to that of a picture.

Mr. Storey's "After You" (47), and Mr. Wynfield's "Death of Buckingham" (48), are pictures which many will be glad to see again. Mr. Storey's well coloured and pleasing little composition is one of the few works here where a sense of humour is shown, and which can hardly fail to provoke a kindly smile. We come after these to a picture by Mr. Bedford of "Elijah and the Widow" (54), which deserves notice not only on account of its powerful execution, but because it exhibits excellently that modern mode of painting scripture scenes which consists in representing them as incidents of modern Oriental common life. There is much to recommend this mode of treating these subjects, but a great artist might be true to nature and to costume, and yet give to the prophet that dignity of manner and countenance which are wholly wanting here, and which would have raised this picture to the level which its noble subject demands. Passing a powerful but unpleasing "Rosamund," by Archer (57), and a slight but pleasant picture by Horsley, we come to Mr. Watts's "Daphne" (66), a single nude figure with the eyes cast down, broadly treated, though feeble and faulty in drawing here and there. The bust and head are full of beauty, and the whole is grave and dignified. Mr. Watts is a painter whom it is the fashion to admire, and who always has noble aims, and often reaches what he aims at—namely, the dignity resulting from broad treatment, and working to a large scale.

Mr. Elmore's "Lenore" (69), a poetical picture, a fine example of the master, and exceedingly well seen, has merits of a high order; the weird procession rushing across the canvas to keep pace with the galloping steed has a whole world of mystery and power in it, and the longer the spectator looks, the more he feels that, though not free from defects, this is a picture of real and striking power.

Works by O'Neil, Ward, Walker, and Armitage, which hang near the centre of this gallery, are hardly any of them to be referred to as specimens of their authors' best, but in "Midsummer Moonlight," by Raven (86), we have a picture that is a worthy pendant to Mr. Elmore's wild idea; this landscape, to the full as poetical and mysterious as the "Lenore," is yet true to nature, and is one of Mr. Raven's best works; it is extremely well seen here. Near this picture hangs a portrait by Sant (79), which better retains the sentiment of the noble English school of portraiture than any other picture in the galleries; the face is wanting in force, and perhaps in finish, but the grace and sweetness of the whole picture would not have been unworthy of Reynolds. Among familiar pictures which we are glad to find here are Mr. Graham's landscape "Along the Road" (90), a picture remarkable for the power with which a comparatively ordinary scene is made to look striking; Mr. F. Dillon's highly finished "Great Pyramid;" Mr. Thorn's striking and masterly "Christmas Eve (48); and Mr. Halswelle's, "Roba di Roma;" but a finer picture than any of them hangs at the end of the room in Watts's study of the head of Robert Browning (106). Were all the works of this artist as simple, dignified, and clearly defined as this noble head, he would fully merit his reputation—a reputation hardly borne out by all his exhibited works. This, however, may fairly be named as one of his best, and is a genuine piece of good portraiture.

A careful picture of the Roman forum of Trajan (114), by the late Sir C. Eastlake, will be seen with pleasure, though it is not remarkable for anything beyond care and truthfulness. Mr. F. Dicey's portrait of Mr. Smith (123) is a favourable specimen of this rising portrait painter's work. The handling shows the results of continental study, and compares well with that in one or two pictures by foreign artists which have crept into this part of the gallery. Perhaps the most interesting picture here is that we now reach, by Millais; we have here his earliest exhibited picture, "Pizarro" (130), a work in which little beyond the energy of the composition gives promise of the splendid success awaiting the young artist. The secret of that success is to be found in the severe study of nature which could so discipline the hand and eye as to enable it to produce such a picture as "Ophelia" (450), hanging in the adjoining gallery. This was very famous when first exhibited, and few will regret to have an opportunity of renewing their acquaintance with so celebrated a work of the leader of the pre-Raphaelite manner, painted when that manner was at its height, and rich to excess in colour and finish. If one of Millais's latest, and most freely treated works, such, for example, as his "Pensioners in the Crypt of St. Paul's" had only been here also, the three would have formed a series of which the beginning, middle, and end represent an amount of change very rarely found in the works of so young a painter.

Passing a clever picture by Douglas, "The Spell" (148), which we do not recollect to have seen before, and a very well-conceived eastern scene by Elmore (153), which few frequenters of the Royal Academy will forget, we come to two excellent landscapes, one by a Scotch artist, and breathing in every part the sentiment of Scottish scenery, while the other one, English in its origin and its subject, is as true to nature in every respect. We refer to Mr. W. B. Brown's "Glen Sannon" (189), and Mr. Lucas's "Passing Shower." These are among the best contributions to the gallery, and are pictures which can be studied with pleasure by every lover of nature. They, perhaps, fall short of the very highest degree of excellence possible to landscape art, though both, Mr. Lucas's work especially, undoubtedly have very high merits as works of art; as transcripts of nature—that is to say, finished studies—they leave little to be desired. The only other pictures in this gallery which it is necessary to name are a somewhat successful incident picture by Hayllar (209), and O'Neil's well-known "Volunteer" (200). This picture, though disfigured by the blackness of colour to which this artist is liable, is a far better specimen of his power than "The Last Moments of Raphael" (77), which we passed without remark. Were "The Volunteer" not a very familiar picture, we should feel bound to describe it fully; as it is, the visitor who cares to make these notes his guide will thank us if we urge him to examine the picture in detail, despite the repulsive effect which its general gloom produces on the eye. We doubt whether there be any painting here more full of human interest, so well thought out, so vivid, in the life, action, and energy which pervade every part, and so artistically yet simply put together.

The Southern Gallery, Room No. 10, boasts but few pictures which rise at all above that general dead level of passable common-place of which we have already complained, and of those few we have already noticed the most prominent. Mr. Basil Bradley paints "Scotch Cattle" (282) with an eye for a beast which a dealer might envy, and a touch worthy the picturesqueness of his subject. Mr. Eyre Crowe, in "Goldsmith's Mourners" (315), and Mr. Horsley, in his admirably painted "Negotiating a Loan" (325), give characteristic specimens of English work — Mr. Horsley's the best, but both good; and a fine landscape by Mac Whirter (329), and a sea-coast scene by Webb (365) may be bracketed together as examples differing widely, but of genuine merit. If we refer to (350), O'Neil's "Luther," it is only to express our surprise that so able a painter can have been betrayed into producing so inferior a work. The prostrate monk is nothing better than the painter's lay figure tumbled on to the floor, and it would have been a kindness to the painter of "The Volunteer" had the Hanging Committee shut out this example of his weakness.

A pair of capital little pictures, "La Brodeuse," by A. S. Lumley (383), and "The First and Last Page," by Kate Bisschop (385), ought to be pointed out as refreshing specimens of thoroughly good work: the lady's picture the best of the two, and very good. Mr. Storey's "Godiva" (409), though here and there faulty in drawing, would be a good, nay, a great, picture, were it not for the one unpardonable defect, that it is *not* Godiva, but only a nude model which we see, and that from having failed to grasp the sentiment of his subject, the painter has, like so many others whom we have noticed, given us nothing better than a fair academy study with a good background. Mr. Dawson's "Old Men of War" (411), holds its own well against a famous Dutch sea-piece by Van Heemskerck (404) hung near it, which is no small praise; and after it we come to fair examples of Poynter (429), Hook (438), and the late John Philip, the prince of colourists (414, 449, 451), to a well-known mysterious and extreme picture by Watts (445), and to a fine view of the "Falls of Niagara," by the late L. R. Mignot (456), extremely well hung, and well worth attention.

The Queen has lent one of the finest specimens which exists of Landseer's best time in "The Sanctuary" (460), and it is a happy thing that at the time and in the gallery where the decadence of a great artist's powers is so painfully shown—for a portrait of Jacob Bell, which we have forborne to mention hitherto, is as weak as "The Baptismal Font," now exhibiting at the Royal Academy—there should be something to remind the public that, in the plenitude of his power their favourite was an artist who deserved all the praise that has been so liberally bestowed upon him.

The best pictures remaining include a small Leighton (469), a bright bit of character painting by Faed (475), a second example of Alma Tadéma (486), "A Slave Market," by Giraud (482), and Mr. Watts's "Portrait of a Lady" (481), which we might pronounce a successful plagiarism in the Venetian manner were it not that once more we have to deplore that it fails when it comes to the one point which would lift the work above the regions where the observer has the right to complain of copyism, plagiarism, and the other *isms* which make food for the critic, to that higher ground where the man of genius escapes the fetters of rule, and yet is beyond doubt right in his work. The face of Mr. Watts's lady is meaningless, and lacking in individuality and power. Had this provokingly unequal painter treated her countenance as he painted Mr. Browning's, this might have been the greatest portrait in the gallery.

In leaving this part of the Exhibition, we consider that we have in it a very tolerable representation of English painters and painting. We miss the sacred subjects, which a very few of our painters—Holman Hunt and Herbert, for example—paint not without success. We miss the fruit and flower pictures, which, thanks to the late Hunt and Lance, and to Miss Mutrie, have become a *spécialité* of English work. There are no sea-pieces by that wonderful master Brett, and no landscapes by the Linnels, and some of our best painters of portrait are wholly unrepresented, as are many of the painters who have a speciality, such as Albert Moore or Lewis among sensational colourists; Cook and the Stanfields among marine painters; and Ansdell, Goodall, and half a score more prominent names. Still, Frith, Elmore, Faed, O'Neil, and Sir Edwin Landseer give a very fair representation of what the most characteristic branches of English art can do at their best. Leighton's contribution, followed at a considerable distance by Poynter and Watts, exhibits well the classical and ideal manner which, happily for us, is not altogether abandoned; Lucas, G. Cole, and the Scotch painters, represent our landscape art adequately, and though the collection would be much the better for vigorous weeding, it will well repay the trouble of a careful and studious visit.

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Mr. J. Netten Radcliffe, M.D., one of the Local Government Board, has been sitting at Kilburn, inquiring into the sanitary condition of that quarter.

The National Memorial to the Prince Consort, erected in Hyde park, was on Monday visited by the Queen, the Duke of Edinburgh, Princess Louise, the Princess Beatrice, and Prince Leopold. The proceedings were entirely devoid of ceremonial. The monument was subsequently visited by a considerable number of persons invited by the Executive Committee. The hoarding was removed on Wednesday.

ARCHITECTURAL ASSOCIATION.

THE last meeting of this Association for the present session was held on Friday evening last, Mr. Rowland Plumbe, President, in the chair. Mr. F. L. Canning was elected a member, and Mr. A. Twyman proposed for membership. Mr. B. A. Paice, one of the honorary secretaries, announced that those members who lately visited S. Alban's Abbey had, on the return journey, clubbed together and raised a donation of two guineas for the S. Alban's Abbey Restoration Fund. A letter from the Rev. — Lawrence, the vicar, acknowledging the receipt of the sum, was read.

ELECTION OF OFFICERS FOR SESSION 1872-73.

Messrs. F. W. Tasker and T. W. Cutler, having been appointed scrutineers of the voting papers, on their return announced that the following gentlemen had been duly elected office-bearers for the next session:—

President, Mr. J. Douglass Mathews.

Vice-Presidents, Messrs. E. J. Tarver and G. H. Birch.

Committee, Messrs. Blashill, Lee, Plumbe, Quilter, Redgrave, Riddett, Ridge, R. P. Spiers, W. L. Spiers, and T. H. Watson.

Treasurer, Mr. J. Douglass Mathews.

Auditors, Messrs. Stephen Salter and E. I'Anson.

Secretaries, Messrs. B. A. Paice and S. F. Clarkson.

Librarian, Mr. H. C. Boyes.

The President: I have now to call upon Mr. Robson, the architect to the London School Board, to read a paper on school-planning. Mr. Chatfeild Clarke had undertaken to read a paper on the subject, but he has been unable to do so in consequence of numerous engagements and of the very poor state of his health. Mr. Robson has, therefore, very kindly consented to act as a substitute for Mr. Clarke.

Mr. E. R. Robson then read the following paper:

SCHOOL-PLANNING.

This subject is one which may appear to architects as so simple, and even trivial, as apparently to need little discussion, but in reality the problem of how to produce the best planned school (depending as it does upon the previous problem of how to teach in the most efficient manner) is one well worthy of their careful attention. Various forms of schools have been adopted in different countries, with various degrees of success, but it would still seem that none of these form a perfect model for our country to adopt, although each may furnish a contribution on some point or other. The Irish School consisted generally of large rooms planned to give either a double arrangement of benches and desks along each side of the school-room, with classes intended to stand at certain points, or were arranged with desks down the middle of the room and standing-space for classes on both sides. The line of desks being generally broken at intervals of two, this plan had the advantage of enabling the teacher to pass easily to one side of any pupil at any moment by the intervening gangway, and the class-rooms were few in number. On the other hand, the Prussian system, as it is called, has been much praised from the circumstance of its classes being all taught in separate rooms. It has not, as a rule, any general school-room, but the school consists entirely of class-rooms, although in some instances a hall is provided for lectures and examinations. The advocates of the Prussian system allege that it produces the greatest results when tested by public examinations, while others say that without a general school-room such a plan merely offers facilities for the greatest amount of "cramming." The Americans have followed the plans of the Irish schools to a considerable extent, and in their schools, as shown in the published reports and plans thereon, many of the main features of an Irish school are frequently to be found, although there are, of course, differences, arising from the different opinions on education prevailing in America. On one point American opinion differs widely from that prevalent on this side of the Atlantic, in the circumstance that the whole of the education is carried on in mixed schools, the sexes being taught together to the end of the course. A specimen of this system of mixed schools throughout may be found in the Wesleyan schools near Tredegar-square, Bow. In England hitherto, owing to the want of a general system of public education, funds have always been exceedingly scanty, the only moneys derivable from the State being "grants in aid." The result has been to necessitate the greatest economy in school buildings. As the funds have been generally raised with great difficulty, proper arrangements have been curtailed, and due regard to efficiency (especially in the article of class-rooms) frequently neglected. As before remarked, the advocates of the Prussian system show that it produces the greatest results when tested by public examinations, but the advocates of the English system, on the other hand, maintain that the latter promotes general intelligence in a much higher degree, in consequence of that attrition of mind arising from the assemblage of a great number, and commonly called "the sympathy of numbers." The English system seems to demand a general school-room as an indispensable necessity, and if this be provided in addition to the number of separate class-rooms required for the whole of the children, then there is a serious increase in the expense of the building, and, in fact, a superfluous and extravagant amount of accommodation. And it may fairly be laid down as a proposition that only in schools of the very largest size, where the cost of the additional school or hall can be distributed over a large area of children, should such a system be adopted, and even then only for special reasons sufficient to outweight motives of economy. At the risk of being considered unnecessarily elementary, I must now proceed to indicate a few of the points which may be considered to govern, in most cases, the plan of a good school suitable for children in large English towns. I hesitate the less to do this from perceiving many indications on the part of architects that the thoughtful planning of a school is a subject beneath their notice. As two instances, I may mention that I observed the other day published in one of the professional journals (apparently as a model) the plans of a new school, in which nearly all the internal uses—the daily life, so to speak, of the building—appeared to be overlooked or despised; and, again, I read with some astonishment a conspicuous article in another professional journal, criticising plans as though the only object in designing schools was to make them look pretty outside. "Design prettily, usefully if thou canst, but prettily." Still, I must crave the indulgence of the many architects who cannot be ranked in the same category in stating many points so well known to them.

Infant Schools.—Under the Elementary Education Act, infants cannot be compelled to attend school before the age of five years, but, in point of fact, large numbers do attend before that age, and it is expected that they pass into the graded schools at the age of from six and a half to seven years. Architects cannot too clearly bear in mind the fact that in the infant school there are no standards or grades, but that these only commence after passing the infant stage. An infant school appears to divide itself naturally into three parts:—Firstly, the youngest class of children, who may be termed "babies," and who should have a room devoted to themselves where they can be simply amused; secondly, the main body of infants who are progressing through the usual stages of infant teaching, of which a large amount can be taught in a well-planned gallery, and to whom marching is a very important element, requiring clear floor space; and thirdly, an advanced class, which is almost ready to be drafted into the graded schools, and who should be provided with benches and desks, and may be taught in a separate room. Sliding partitions are not, as a rule, desirable in infant schools, and the width and proportion is seldom that which is found to be most useful for a graded school. It is most important that the lighting to the large gallery should be from the side, and the class-rooms should enter from the school-room, with panes of clear glass to enable the mistress to see what is going on. Circles in the floor for teaching classes, and lines for marching by, are also highly desirable. If the rooms are warmed by open fires they should have guards to prevent accidents. Of all kinds of playground, that for the infants must be considered the most important. The young children depending so much upon sun and air, their playgrounds should be made to face the south, and have a portion roofed for protection from the weather. Although it is not considered desirable to have the infant schools above the level of the ground floor, still, recollecting that the proportion of the infant school is so different from that of a graded school, and looking to the value of land in the metropolis and other large towns, it seems desirable that in many cases where a large school is to be built, one infant school must be placed above another. Under such circumstances, the staircases should be carefully planned so as to be easy and safe for such small children, and what are technically known as "winders" should be carefully omitted.

The general planning of a group of schools will be very much controlled by the site and its aspects in relation to school and playground, and, having secured the infant department in the best position for sun, the graded schools may be raised upon a low story of eight or nine feet, so as to obtain there covered playgrounds for some portion of the school underneath.

Graded Schools.—In going into the question of graded schools, it is necessary to keep before us what is meant by the term "graded." According to the Education Act, the lessons are to be given in six separate "grades" or "standards," and although when two standards are small in number, they may be taught in one class together, yet, as a general principle, there should be a separate class of from thirty to forty for each of the six standards. In the larger schools this arrangement will be doubled, so that each separate standard will have two class-rooms, and the school may then be planned in two portions, as "junior" and "senior." Architects will do well to bear in mind that this question of grading the school in six standards—in other words, of planning a class-room for every class, is a vital point in all school planning. Mixed schools are not at present in much favour in this country, because their adoption appears to narrow the field for the employment of schoolmistresses to infant schools only. Much has been said as to the right kind of aspect for the main frontage of a school, and some have even gone so far as to say that none but a northern aspect was desirable, but it must be remembered that sun is to a child very much what it is to a flower, and that, having due regard by systems of blinds to the inconvenience from heat in summer weather, it is difficult to make a school in this sunless climate of ours too sunny. In planning a school-room and its class-rooms everything is, of course, subservient to convenience of teaching. Thus, in the principal room, the desks should be ranged along one wall, and the principal amount of lighting should be from the back (as it cannot, as a rule, be supplied from the side). The lighting should be rather highly placed. But on the opposite side of the room it is necessary to have some other windows, so as to secure through ventilation in the hot summer weather. Each pair of class-rooms should be so arranged that two groups of from twenty-five to thirty-five, or even forty children each, may be taught together by the same teacher, and the same rule is applicable to the classes in the school-room, which if arranged in couples of twenty-five, thirty, thirty-five, or forty, will enable one master to teach the two. And in every case the wall opposite a group of benches or desks is of value for the display of diagrams, maps, and other objects used in teaching, while the upper part of the wall is useful for lighting and ventilation. I may here say that I have lately seen a letter in the BUILDING NEWS which condemns lighting from the back very strongly, but I always consider that that is a most useful plan, provided the windows are sufficiently high, as then the light is thrown on to the master's face and on to the blackboard or diagrams, while the scholars themselves have a sufficiency of light. A girls' school should generally be grouped in relation to the infant school, and its entrances not far removed from those of the latter, while the entrance to the boys' school should be kept as far off as possible, and, in the case of a site having two frontages, should be placed in the other street. It is necessary in the graded schools to have a lavatory and also cap and bonnet rooms, compactly and economically planned, close to the school-room itself, with two doors, so that the children may be filed in and out by the teacher in an orderly manner. The fittings of the school-rooms have been much discussed, and much difference of opinion expressed as to the best methods. But in infant schools it is admitted that gallery teaching is mainly the best. When, however, we approach the graded schools, there is much divergence, some insisting that benches and desks are the best, and others that there should be a gallery for occasional collective teaching. Both systems appear to be good, but the opponents of the gallery system allege that in a graded school the introduction of a gallery wastes space, and it would appear that a gallery is only likely to be well utilised for the two lowest standards. Another point appears to require consideration—namely, that in the senior standards the older children will require rather more space than in the lower standards, and that perhaps the best way of meeting the difficulty is to consider the class-room for the two senior standards as available only for a slightly-reduced number. This is supported by the circumstance that when Board Schools have been in operation some time, a percentage of those who have commenced in the first standard will be lost by death before reaching the last. A pair of classes in the upper standards would hardly appear to require division, as in the lower standards, because of their better discipline. Each class requires a separate cupboard for its books and papers. And, indeed, a separate room attached to each room, to be called an "apparatus room," seems highly desirable, while in the case of the large schools about to be erected in London, a general room, available as a committee room for managers and also for the use of the masters or mistresses, can hardly be dispensed with.

Much has been said and written upon the vexed question of ventilation, some advocating one system and some another. My own experience is that for a large building there is nothing like an artificial system, constructed to supply warmed fresh air and extract foul air. No doubt the open fire is the best of all, but in the face of the price of coals rising each successive winter, according to its habit of late, it would appear that as a matter of permanent economy something else must be resorted to. It is not necessary merely to warm and re-warm the air which exists in any given room, and to allow the children to breathe it again and again, but to take care that there is an ample cubical supply per minute for each child, and that this is taken off in a regular and even manner, the great object of ventilation being to avoid stagnation of air. In the case of warming a church it may suffice to have the pipes above the floor, and to warm the cold air contained in the building for the purposes of a congregation present an hour and a half at a time; and the same may be said of the practice of sending up volumes of air heated by means of hot iron plates, commonly known as "cockles"—a system always liable more or less to vitiate and deteriorate the air, and not to be tolerated for a day in connection with an atmosphere which young children have to breathe throughout the day and day after day. (Hear, hear.) A chamber fitted with iron pipes heated by hot water on the low pressure system, through which fresh air is passed and admitted to the various rooms at suitable points, while means of egress can easily be provided in connection with some artificial extracting power of which the furnace of the apparatus already mentioned can be easily made to supply the source, appears to me to be the safest and best. One reason why artificial warming and ventilation has not been hitherto more generally adopted is that schools have hitherto been of a much smaller kind than they are now likely to be, and the cost of a care-taker continually on the premises, able to take charge of the apparatus, as well as the repairs of the gas-piping, window panes, warming apparatus, and various other matters about the building, was not to be thought of, and there is no doubt that the schoolmaster cannot himself properly manage the apparatus.

The cost of a school is a more serious point than architects seem at present disposed to consider; but it may be laid down that, irrespective of the price of land and of the cost of boundary walls and playgrounds, the building *per se* should be admirably completed at from £6 to £7 per head as a maximum.

On the subject of the external architecture of schools, I would venture to add that as this Association has always laid down most strongly the principle that the design of a building should clearly express its purpose, its members will probably agree with me when I say that a school should appear like a school, and not like a monastery, a town hall, or a set of almshouses. Large towers, prodigious roofs, exaggerated gables, wrought-iron ridge excrescences doomed to speedy decay, and wrought-iron "gable ornaments," are all better avoided. The really skilful architect will know how to make his school look like a school without the use of unnecessary or absurd features, and will plan his building carefully, properly, and economically, giving due and thoughtful expression to the whole, so that his work may contribute, however humbly, to the world's wealth of architectural art, and even tend to produce, I will not say a new, but a better style of school architecture arising out of the present great demand for school buildings. The student will find useful and interesting information in the following works:—1. "Hints on Infant Schools," published by the Home and Colonial School Society. 2. "Reports of the Commissioners on National Education in Ireland." 3. "Description of the Schools of Berlin," by Adolf Gertsenberg, Government Architect. 4. "Practical Illustrations of the Principles of School Architecture," by Henry Barnard, Superintendent of Common Schools in Connecticut.

A long discussion ensued, in which the Rev. Canon Cromwell, Mr. T. Roger Smith, ames Watson, Mr. T. Chatfeild Clarke, Mr. Lacy W. Ridge, Mr. Riddett, and the Chairman took part. A full report of the discussion is in type, but is crowded out until next week.

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On the 29th ult., the Bishop of Chester consecrated the new parish church of Outrington, near Lymm, Cheshire. It is designed by Messrs. Slater & Carpenter, architects, and will accommodate 450 persons, at a cost of £7,000.

S. ALBAN'S ABBEY.

THE following is the report of Mr. George Gilbert Scott, R.A., presented [to the Earl of Verulam, as Chairman of the Restoration Committee of this grand Abbey Church:—

First in rank among English Abbeys, and marking the scene of the death of the first Martyr of Britain, no church in our island so well merits that loving care which it is the honour and privilege of our age to devote to the sacred edifices which have been handed down to us among our most precious inheritances: nor is the fabric itself unworthy of its historical fame. Stern and colossal in its external aspect, it will be found by the stranger to contain under its severe and rough exterior some of the choicest as well as the most interesting specimens of nearly every period of English Architecture, and to equal most of our cathedrals in the beauty of its Mediæval monuments.

As my report may fall into the hands of many who are unacquainted with this most venerable structure, I will beg your lordship's permission briefly to detail what you know so well as to the general outline of its architectural history and characteristics.

Of the Romano-British church erected in the days of Constantine over the grave of the Proto-Martyr it is needless to say that we have no existing remains. It was standing in the time of Bede, and still later in that of Offa; indeed it is not certain that it was wholly rebuilt by that king when he founded the Monastery; so that it may have remained incorporated in the Anglo-Saxon Church till the period when the present gigantic structure was erected, and its fragments, indistinguishable from the mass of Roman material of which the church is so largely constructed, may yet form part of its venerable walls. Nor, again, have we any part standing of the Anglo-Saxon structure; though here we are more happy, for we do possess some of its architectural features re-used in the Norman building; many of the small columns of the triforium of the transepts being formed of the baluster columns of the previous church, to which Norman capitals and bases have been added when re-used. Now, a question arises: Are these columns, though Saxon, as early as the time of King Offa, and did they form parts of the church which he erected or restored at the suggestion of Charlemagne?

It is my good fortune to be able, as I think, to throw some light upon this question. I was engaged some years back in repairing the Saxon church on the Castle Cliff at Dover—said to have been built by Eadbald, son of Ethelbert, the first Christian English King—when we found, used up for later purposes, balusters just of the same kind. Again, I was repairing the Saxon church of Jarrow-on-the-Tyne, the very church in which Venerable Bede ministered, and erected just before by Benedict Biscop. Here, in removing some modern walls, we found, bedded in them as mere material, no less than 20 of these curious columns. Shortly afterwards, in the sister church at Monk Wearmouth—erected also by Benedict Biscop and described by Bede—a doorway, long walled up, was opened out by the local Antiquarian Society, when four such balusters were found in their proper position, forming portions of its jambs. If, then, we find in three churches, all of the seventh century, baluster columns of the same kind with these at S. Alban's, why need we doubt that the latter form portions of King Offa's church, which was erected (either wholly or in part) in the succeeding century? We may, then, fairly assume that we have in the present structure features which belonged to that which immediately succeeded, or even formed a part of the church built on the scene of martyrdom, and within about 10 years from the death of the Proto-Martyr.

Our more immediate subject, however, is the church which still exists.

To a stranger first visiting S. Alban's, and unprepared for what he has to see, the aspect of the church is striking in the extreme, and calculated to inspire a feeling of veneration amounting almost to awe. Its commanding position, occupying by its enormous length the ridge of the hill on which it stands, and presenting its southern side wholly unobstructed to the distant view; its colossal scale, equalling that of our cathedrals, and exceeding any of them in its length; the stern severity of its central tower and of the other portions of the Norman structure—all these, added to its appearance of hoary antiquity and to its unaccustomed material—being in the main of Roman brick—tend to produce an impression different from that caused by the first view of any other English church, and one which seems to demand that the traveller shall stop and inspect it more closely. Such inspection will not fail to add greatly to his interest and admiration, while such feelings become largely mingled with melancholy regret that an edifice so stately, so sacred, and so replete with historical and antiquarian interest, should have been so shorn of its former splendour and have reached our day a mere wreck of its old magnificence.

The church as it now in part exists was erected by Paul, the first Norman Abbot, during the latter years of the eleventh and the beginning of the succeeding century. Paul had been a monk of S. Stephen's, at Caen, of which church, founded by the Conqueror, the first Abbot had been Lanfrank. But, though Lanfrank, when promoted to the See of Canterbury, had been content to rebuild its cathedral on the almost precise model of his Abbey Church at Caen, Paul, his kinsman, when advanced from being a simple monk at Caen to the Abbacy of S. Alban's, was by no means so unambitious, but at once set about rebuilding the church on a scale vastly exceeding that of the newly erected metropolitan cathedral. Not unlike that church in general plan, it exceeded it in size in every direction; for, while at Canterbury the nave was but nine bays in length, he made that at S. Alban's thirteen bays; while the choir at Canterbury had but two bays besides the apse, that at S. Alban's had five; and while either transept at Canterbury had two bays and a single apsidal chapel, those at S. Alban's had each three bays and two chapels. And, finally, while at Canterbury the western towers terminated the aisles, thus giving a façade of about 90ft. in width, those at S. Alban's projected clear of the aisles, giving it a façade of more than 150ft., and the entire lengths of the two churches were respectively about 290ft. and 460ft. The cost of this enormous excess in dimensions was, perhaps, in some measure compensated by the vast supply of materials which had been collected by the later Anglo-Saxon Abbots from the ruins of Verulam; and, while the use of Roman tile gave a rudeness and simplicity to the architecture, the saving in outlay must have been very great, as the square form of the bricks obviates almost wholly the cost both of purchasing and working stone. This saving was clearly devoted to obtaining colossal size at the sacrifice of architectural detail. The church, thus erected of rude material, was encrusted wholly with plaster both within and without. Externally it must have been like a snowy mountain—one uniform sheet of white covering every form; but within, this uniformity of surface was richly relieved by decorative colour, of which many interesting remains have recently been brought to light through the patient care of Dr. Nicholson. The exterior has now acquired a somewhat corresponding relief, for while the old plaster has become coated with lichen and its surfaces vermiculated and weatherstained, the parts from which it has fallen off show here and there surfaces of brickwork like those of a Roman ruin, the whole having thus acquired by lapse of time a rich and impressive aspect. This use in Mediæval buildings of the materials left by the ancient Romans, though carried to a greater scale in this than in any other building, is by no means unique. We find it in the Saxon churches of Brixworth and Dover; at Colchester we see it in the Saxon Church of the Holy Trinity, and also in the Norman Castle, and in the Church of the Priory of S. Botolph; and, every here and there where a Roman structure was at hand, we see its well-burnt tiles doing duty in the existing church. Here, however, at S. Alban's we find this re-use of the relics of Roman domination—this spoiling of the Egyptians—on a scale far exceeding that of any original Norman work now remaining in Britain.

We have remaining to our own day a considerable portion of the work of Abbot Paul, consisting of the central tower, the entire transept, one bay of the aisles of the choir, three entire bays of the nave, and six more bays of its northern side. The whole of this is in the same stern character; majestic in its scale and proportions, but devoid of any approach to decorative character. One fragment only remains of a richer form of Norman architecture—a small chamber against the end of the south transept which separated the chapter-house from the church. This contains details of exquisite beauty—a work of the middle of the succeeding century. The next work in point of date is the lower portion of the west end. Abbot John de Cella, a prelate of more taste than worldly wisdom, conceived (about the year 1195) the ambitious idea of rebuilding the western façade with its flanking towers in the rich early English architecture of his period. I will not detail the misfortunes and disappointments of this over-sanguine Abbot, so amusingly narrated by Matthew Paris, arising, as his historian tells us, "from his attending but little to that admonition of which mention is made in the Gospel—that is to say, 'he who is about to build should compute the cost,' lest 'all begin to jest at him, saying, "this man began to built and was unable to finish it."'" Suffice it to say that after employing three architects for several years, and obtaining money in every way he could think of, he was obliged to limit himself to the erection of the three portals, and probably hardly finished them. Yet let us not be too severe, for, like a work we have recently heard of in our great Cathedral in London, its quality goes far to compensate for incompleteness. I doubt whether there exists in England a work so perfect in art as the half-ruined western portals of S. Alban's. I venerate the architect who designed them, who, I believe, was Abbot John de Cella's second architect, Gilbert de Eversholt. His work is cotemporary with two others which are as fine as almost any in existence—the western porch at Ely, and the choir of S. Hugh at Lincoln. All of them were the works of the earliest perfected "Early English" after it had thrown off the square form of the Romanesque capital; and I believe it to be also cotemporary with another of the finest English works—the Sanctuary of the dependent Monastery of Tynemouth, which, however, retains the square capital. Next to this exquisite work is that of Abbot William of Trumpington, who, in a more economical spirit—with more of business but less of art—carried on the work which De Cella had relinquished in despair, completing the west front (now almost destroyed) and finishing five bays of the nave on the south side, and four on the north, besides many other less important parts. His works are noble specimens of "Early English," though without the spiritual character which marks the work of De Cella. It is most interesting to trace out the limits and the points of junction in the works of the two Abbots, and to observe the remorseless way in which the man of business cut down the details of the work of his more ambitious predecessor. Columns with bases for eight shafts reduced at the capitals to four; the marble bandings prepared for the larger number, but roughly altered to suit the reduction; while the marble largely used or contemplated by the one is almost wholly omitted by the other.

It was fully twenty years after Trumpington's decease before any other great work was undertaken in our Abbey. During that interval the style had undergone much change. Henry III. had begun and carried on to a considerable extent his works at Westminster. The Chapter-house of that Abbey had been completed in 1253, in which the principle of traceried windows had been carried out to a perfect ideal. In 1256 it was found necessary to rebuild the eastern arm of the cross of S. Alban's, and we cannot suppose that the first in rank among English Abbeys should fall short in advancement in style of the second Abbey only some twenty miles distant. Accordingly, we find the work of John of Hertford and his immediate successors to be among the finest productions of their period. The reconstructors of these eastern portions of the Abbey seem to have commenced, not only the sanctuary of the church with the chapel which contained the shrine of the Proto-Martyr, but also the chapel immediately east of it, in which was placed the shrine of S. Amphibalus, the Proto-Martyr's friend, with the chapels on either side of it; and yet, further eastward, they commenced the Lady Chapel itself, though its completion was left to a later date. Nothing can be finer than the works carried out at this period. They were never perfected according to their original design, but what was done was as perfect in art as anything which its age produced; indeed, its window tracery is carried to higher perfection than in any work I know. I do not think it was carried out to anything approaching completion under Abbot Hertford, as its style carries us on apparently to the last decade of the thirteenth century, agreeing in character with the Eleanor crosses, and with the work of De Luda, Bishop of Ely, in the chapel of his palace in London, which we know to have been erected after 1290. Next in date comes the completion of the Lady Chapel, which was carried out by Abbot Hugh de Eversden between 1308 and 1326—an excellent work of the perfected Middle-Pointed style, but as inferior in artistic sentiment to the works last referred to as Trumpington's was to that of De Cella. In the very year of his accession to the abbacy, we learn from a document in the British Museum that Hugh de Eversden renewed the marble substructure of the shrine of S. Alban, of which the late Dr. Nicholson discovered the exquisite remains while opening out one of the walled-up arches east of the "Saint's Chapel." During Eversden's abbacy a portion of the south side of the Norman nave fell—and to him we are indebted for the five beautiful bays on that side which continued the work of Trumpington and included the portion of the cloister wall adjoining, a work, perhaps, of greater merit than his Lady Chapel. Its vaulting was, however, not completed till the time of Mentmore, the second of his successors. Subsequent to this date the works carried on in the actual structure of the church were for the most part rather deteriorations than improvements, though the sepulchral monuments of the next age, as well as the screens and other minor works, are replete with beauty and interest, and tend to render this church one of the most thrilling interest among those which have come down to our day, as well as being a mine of architectural wealth which can scarcely elsewhere be paralleled. Such is the venerable and beautiful edifice, on the present condition of which I have now to report.

When we come to reflect on the fact that this stupendous building, little short of 550ft. in length, and whose roofs may almost be measured by the acre, has for more than three centuries been left for its conservation to the resources of a single parish of a moderate-sized country town, aided occasionally by the subscriptions of the neighbouring gentry, we need not wonder that its present state of repair is unsatisfactory; nor when we think of its colossal dimensions need we feel surprised that it should be a costly matter to repair its dilapidations. It is, in fact, a genuine cause of wonder that it should have stood so well against circumstances so adverse.

The injuries which the building has sustained may be classed under the following heads:—

A. The deterioration of its design during the latter part of the middle ages, and the earlier portion of the succeeding period, mainly arising from decay in taste and artistic sentiment.

Under this head may be enumerated—1. The removal of all the high-pitched roofs, whether of the clerestories or aisles. The latter included the lowering of the walls which sustained the original aisle roofs, and the exposure to external view of the backs of the Norman triforia, which were thus converted into windows. Nothing could tend more than these alterations to the reduction of the dignity of the external aspect of the building. Unfortunately, the correction of this defect seems so formidable a work that one scarcely feels to have courage to propose it. 2. The alteration of the great windows, both of the western and of the transept fronts, from their early forms into huge perpendicular windows, an alteration which it seems equally hopeless to correct.

B. The ruthless mutilation of ancient features, which is more or less observable throughout the church, and may in most instances be repaired.

C. The loss of ancient features by structural failure, such as that which has ruined the two side portals of the west front, and damaged the central portal. These losses could be remedied, subject to a certain amount of conjectural restoration.

D. The natural course of decay, whether of stonework, timber, lead covering, or other parts. This class of defect is very extensive, and demands throughout effectual remedy.

E. Actual structural failure, threatening the safety of the building. Of this the most marked instance is that which has been recently detected in the central tower. This is of a very serious nature, and has happily been discovered in time, and effectual means taken to arrest it, or most serious consequences might have resulted.

One of the most conspicuous and barbarous injuries which the church has sustained is the cutting off of its beautiful eastern chapels, a large portion of which has been rendered little better than a ruin, while a public footway has been cut directly through it. No attempt at restoration will be worth the name unless this monstrous piece of Vandalism be obliterated. Indeed, I think that after providing for actual structural safety, this should be the first work undertaken, as the continuance of such a state of things is a public disgrace. Happily, the way has been prepared for this by the restitution to the church of the Lady Chapel, so long made use of as a grammar school. The next step must be the stopping of the footway, which passes directly through one of the most beautiful portions of the church, after which the restoration of those exquisite but ruinous chapels may be proceeded with, while the arches which once united them to the church may be re-opened. These walled-up arches will probably be found to be perfect mines of antiquarian wealth. Some portions of them, already partially cleared by Dr. Nicholson, yielded a rich return of architectural detail, including a considerable part of the marble superstructure of the Shrine of S. Alban—as charming fragments of ancient carving as can well be conceived; and we may hope that the mine is far from being exhausted. Be this as it may, the opening out of these long-closed arches will add to the church features of startling beauty such as one now hardly imagines. The Lady Chapel itself is at present shut off from the intervening chapels, and the opening out of the arch which formed its entrance will add yet another element of internal beauty. This arch was closed only by an open oak screen, of which the remains still exist. The Lady Chapel itself is in far better condition than those which united it with the church, but it requires very extensive restoration. The beautiful wall-arcading which occupied the lower part of its walls has in a great measure been cut away; the vaulting, which, like those of the outer chapels and that of the choir, was of oak, enriched with decorative painting, is now covered by plaster, while its woodwork is much decayed, and other architectural features are sadly mutilated. All these must be fully restored.

The central part of the outer chapels has been originally planned to be divided into three spans, by two additional ranges of columns, something as the Lady Chapel at Salisbury; but this plan was abandoned and the whole covered by a richly-panelled ceiling of oak, now sadly ruined. This ceiling must be restored, and the evidences of the change of plan left apparent. The ruin and dilapidation of these outer chapels is most distressing. Exposed for centuries to the weather, beating through the unglazed windows and the gangways cut through the walls, and used partly for a public thoroughfare and partly for a sort of playground for the boys of the grammar school, who have age after age amused themselves by cutting the soft stone of its beautiful arcading with their knives, these chapels have been reduced to a most melancholy wreck; yet enough remains to show them to have been works of the highest art, and happily enough also to guide their restoration—a work of love and pity, which will be richly repaid by the result.

If we turn our attention for a moment from the eastern to the western extremity of the church, we shall find a somewhat parallel demand for the restoration of exquisite architectural features now nearly lost through their dilapidations. I refer to the three western portals, to which I have more than once alluded. These were deep porches, approached externally by rich and lofty arches and surmounted by high gables, parallel in many respects to the portals of French cathedrals. Unhappily their fronts at some period gave way. That of the central portal was replaced by a plain arch of a late period, but those of the side portals were simply walled up; so that externally these exquisite features are now wholly obliterated, while within they form mere closets, in which fragments of sculptured stone are stowed away. At the risk of having to exercise some degree of conjecture, I think that these portals should be opened out and restored; and I feel confident that in the walls by which they are now blocked up evidences will be found to aid greatly in the work of restoration. It is, indeed, evident that these walls are composed largely of the moulded fragments of the fallen fronts. These portals were built from a level lower than that of the nave, intending to rise by several steps from the first to the second internal bay. This beautiful arrangement was either abandoned or altered, and the consequence is that the lower portions of the portals, as well as of many adjoining parts, are now buried some 2ft. beneath the floor. This must be corrected, and their forms brought out in their noble integrity. Another case of restoring lost features strikes the eye at once on entering from the west. I refer to the lost vaulting of the greater part of the aisles of the nave. Of 26 bays of the aisles eight only retain their vaulting; three of them Norman, and five of the fourteenth century. Eighteen require to be re-vaulted; nine of them Norman, and nine Early English. Somewhat parallel in class are some extensive restorations required in the interior of the choir, where, besides the cutting away of the shafts of piers and other architectural details, some very important features have been wholly removed, consisting of beautiful tabernacle-work projecting over two doorways (themselves now obliterated) on either side. I some years back discovered nearly all the parts of one of these beautiful projections, and succeeded in getting them fitted together, and their materials are still preserved. Many minor cases of the same kind occur throughout the church, which it would be tedious here to enumerate.

The most serious structural defect in the building is that already referred to in the central tower, of which the two eastern piers have shown signs both of subsidence and of actual crushing. The failure of the north-eastern pier extends into the choir, and is shared in a less degree by the east side of the adjoining transept. So pressing was the danger, that signs of increased subsidence showed themselves while the parts which first showed evidence of failure were under repair. Very active measures were at once taken by the application of powerful shoring, followed up by the restitution of the piers of large portions which had long since been cut away from them, and the piers themselves have been greatly strengthened by the substitution of sound for disintegrated material; a difficult and anxious operation. The foundations of these piers have been a good deal weakened by the proximity of graves; and, strange to say, the southern pier had apparently been excavated beneath the floor into a sort of cave, so far as we can judge, with a view to the destruction of the tower. The repairs already undertaken are only such as immediate security demanded, but there remain very extensive dilapidations in the tower throughout its entire height, all of which must be thoroughly and substantially repaired, or it cannot be pronounced safe. Its tendency northwards both increases and is increased by a corresponding tendency in the north transept, which is clearly settling in that direction, and is much cracked. This also demands a decided remedy. The decay of material externally is very extensive. The Norman walls are free enough from this, having no stonework about them; but the later portions have everywhere their architectural features carried out in the soft church-stone of Totternhoe, a material which, though suitable enough internally, is far from durable for external work. The consequence is that throughout the more architectural parts of the building sad havoc has been made by time and the elements. This is especially the case with the long ranges of clerestory windows to the nave, which are shattered in a most lamentable manner, and their ruin is increasing every winter. The old parapets erected of this material have almost wholly perished, and been replaced by brick; and every part which has stone dressings externally shows more or less the sad effects of the use of this perishable stone. In renewing these shattered details I should endeavour to find a durable material which would correspond in colour with the old stone, and this, I think, we have in the Chilmark quarries in Wiltshire, from which Salisbury Cathedral was erected.

The timbers of the roofs and ceilings also demand careful reparation. This is especially the case with the ceilings, which are everywhere very much decayed, and are getting actually unsafe. The lead covering also requires careful reparation throughout, and renewal in some parts; as a rule, it has been carefully attended to—but, as it greatly exceeds an acre in extent, this alone is a work of importance. The plastering and stonework of the interior require to be carefully freed from whitewash. This has already been effected in many parts with a happy effect under the direction of Dr. Nicholson, bringing to view the beautiful and most interesting coloured decorations of the old wall surfaces.

Every Norman pier on the north side of the nave is found to have an altar painting on its western side, forming a sort of reredos to the small altar erected against each. These paintings all represent the Crucifixion, and are most valuable specimens of early art. The simple operation of taking off whitewash from surfaces so prodigiously extensive, and doing it with such care and tenderness as not to disturb the painting beneath, is a work of considerable cost. If we had succeeded in enumerating all the manifest defects of the structure, which would be a wearisome catalogue, the fact still remains that the minor reparations of a building of such enormous extent still form, by the vastness of the surfaces over which it is spread, a formidable and costly undertaking.

To avoid tedious details, which would encumber without elucidating my report, I will accompany it by a rough specification of the leading items of reparation I recommend. It will be seen that I have not calculated anything for internal fittings, nor for the detached objects, such as tombs, screens, &c., having limited myself to the repairs of the actual structure, with its roofs, walls, and floors. My leading object in the treatment I have calculated on has been to insure the perpetuity of the structure, and to guard against the loss of any of its architecture, but to do this with the smallest possible change in its general aspect; such changes being limited to the restoration of such lost features as are essential to its character, especially as viewed from within.

No church in Great Britain more thoroughly deserves a careful and conservative restoration, nor would any more richly repay this labour of love. It is a glorious work, and one with which I feel a special pride in being connected; and I most earnestly wish you every possible success and liberal support in what may fairly be styled a great national undertaking.

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Early on Wednesday morning a large portion of the beautiful church at Hartshill, near Stoke, was destroyed by fire. The organ, which was to have been opened to-day, was literally reduced to ashes. The church was built by the late Herbert Minton, from designs by Mr. Geo. Gilbert Scott. The property is partially insured.

CHOIR OF TOURNAY CATHEDRAL.

MR. ARTHUR N. BROMLEY has sent us a sketch, which we have reproduced by photo-lithography, of the choir of Tournay Cathedral. The view we give is taken from a tower on the south of the cathedral, and looks north. The other drawing is taken from the north aisle, and looks south, and is consequently the interior of one bay of the portion shown in the large drawing.

The colour of the stone of the interior is a delicate gray, and it is very much to be regretted that they are plastering it all over in the apse with red paint. "Anything more hideous," says Mr. Bromley, "cannot be imagined. It makes the otherwise beautiful cathedral look more like a circus. Few people," he says, "come to see this cathedral, but I am sure it would amply repay any one to pay it a visit, as it is not only the oldest but by far the finest in Belgium."

HOLDENBY HOUSE.

ONE of our lithographic illustrations this week represents Holdenby House, a plan and particulars of which we will give next week. This is a portion of the old house built by John Thorp for Sir Christopher Hatton, and now restored by Messrs. Slater & Carpenter for Viscountess Clifden. The plan of the House will be found very interesting.

WOMEN IN ART.

ON Monday last, at the concluding meeting of the Victoria Discussion Society, Cavendish Rooms, Mrs. Julia Ward Howe, of the United States of America, in the chair, Dr. G. G. Zerffi introduced as the topic for discussion: "Women in Art."

The Lecturer said, the outer form of woman was smaller than that of man, the lines nature had used to form her more waving. Her hands and feet were small, her veins transparent, her eyes brilliant. A divine kindness beamed from her rosy cheeks, proving her to be destined for a totally different purpose than man. Activity was the province of man; passivity the sphere of woman. Man was dynamic, woman static. From the very earliest childhood the two sexes were different. Girls were neat, full of intelligence; boys boisterous, fighting, playing at soldiers or sailors. Girls sat often for hours nursing, patting, and fondling a little wooden doll without nose and ears; they appeared to prepare themselves for the time when the wooden doll would be a little human being—God's finest creation. Woman was made for the higher functions of life. Her love was so much more developed. The lower we went in the scale of creation the less we found animals endowed with love. Fishes and amphibia did not care much for their young ones. Amongst insects we found the females already full of a busy love. How tenderly bees and ants watched over their eggs! Some female spiders carried their little ones about, fed them with great care, catching flies for them, and enjoying the sight of seeing them eat. Birds had still greater love. They sacrificed themselves often to save the lives of their young ones. They suffered hunger and thirst to feed them. They plucked out their feathers to procure a comfortable couch for their naked progeny. Even more admirable was the perseverance, patience, and tenderness with which the animals instructed their little ones. Birds taught the ignorant to fly, to catch insects, and to sing. Other animals taught them to run or to jump. The penguins, if their young ones did not go into the water and would not swim, enticed them to a rock and pushed them into the water and made them swim. What was instinct with animals became a conscious duty with men. The higher the animal in the scale of development, the longer lasted its youthful helplessness. Man, the crowning product of creation, was, in childhood, the most helpless of all creatures. Man then wanted a mother's care much longer. All animals fed, nursed, and instructed their little ones till they could stand alone. But man, especially with us, thought himself superior to that law of nature. Man, who wanted so much more care, love, and education, because he wanted so much more abilities and knowledge, had been left without education. If we neglected children, why should we have thought much of women? We treated them according to the old patriarchal principle; called man the "master and lord of creation," and told women to obey, to serve, to love, and to honour him. We disturbed altogether woman's natural position in creation. Women now began to feel their neglected *status*. They wished to be placed in the same position as man, intellectually as well as socially. The Babylonians had already had to grapple with this social difficulty; they had done it in a most practical way. They had endeavoured to procure a husband for every woman. The Mahometans looked upon women as a mere toy. The Teutons were the first to look upon them as something sacred. All prophets and sibyls with them were women, in opposition to the Israelites, who had only male prophets, and who stigmatised women telling the future as witches. Christianity throughout the Middle Ages had fostered the veneration of women by an intense worship of the Virgin Mary, which in reality was only a religious form of the old "Minne" worship. The imaginary and intuitive elements in women were most prominent, and, therefore, they were best fitted to rule in the realm of Art. How could Phidias have produced a Pallas-Athene, "the blue-eyed daughter of Zeus," how Skopas or Praxiteles a Venus, without women? What would have been the works of Canova, Flaxman, Dannerker. Raphael, Corregio, Michael Angelo, Titian, without women? Instead of devoting themselves with so much zeal to the medical profession, there were other branches of art — especially architecture, sculpture, and painting, which might be cultivated by women with the greatest advantage to humanity in general, and to themselves in particular. Now, with regard to architecture — what did history teach us? It had placed not one single woman's name on record as a constructor of buildings, from the wigwam of the savages to our own cottages, halls, churches, and palaces. Architecture would be a more congenial occupation for a lady than the dissecting of a human body. An architect ought to have taste; women ought to agitate to be articled to some of our architects, many of whom, unfortunately, had neither taste nor ideas, and could do nothing but calculate the bricks wanted and the profits to be made. During the Middle Ages women were the decorators of castles and Gothic churches. Theudelinda, Queen of the Longobards, adorned her palace with paintings. The Anglo-Saxon bishop Adelhelm spoke of English women as far-famed for their artistic powers in pictorial products, using gold or silver threads, silk or wool, to embroider on linen, leather, or any other stuff. Besides this field of pictorial embroidery, which was still cultivated to a certain extent in Germany, there was another branch of art, till lately much neglected by women. They ought to turn to fashioning in clay and to sculpture. If women embarked in studying the marvellous construction of the human frame by dissecting it, why should they not reproduce the surface of that body with its telling lines of beauty? Two Princesses, one of France, Marie d'Orleans, the other of England, H.R.H. the Princess Louise, had given a noble example worthy of imitation. Down to the thirteenth century we knew of no woman who occupied herself with sculpture, except Sabina, the daughter of one of the greatest Christian architects, the immortal Ervin, of Steinbach, the builder of the Minster of Strasburg. She kept her father's accounts, paid his workmen, and was the gentle soul of the slowly-growing petrifaction of the most spiritual dome in honour of God. She also took the chisel in her hands, and helped to fashion that lace-like tracery which appeared like a web of love, humility, and beauty, woven in stone. Women used to excel as engravers. In France, Claudina Bouzonnet Stella; in England, Mary Ogborne, Elizabeth Judkins, Caroline Watson, Sarah Reading, and Mrs. D. Turner. It was much to be regretted that ladies had discontinued to use the engraver's needle, which no sewing-machine could replace, as it was the touch and refinement that gave the value, and not the mechanical accuracy. Lastly, we had the art of decorating and painting, the real genuine field for woman's power. We found women engaged in these gentle pursuits of art with skilful elegance. As early as the twelfth century we had Herrat of Landsberg, who ornamented a "Hortus Deliciarum" with most beautiful miniatures. Then we had Margaret, the sister of the celebrated brothers Van Eyck, and the daughter of Gerhard Horebout, of whom Albert Dürer wrote: "Master Gerhard, illuminator, has a daughter named Susan, eighteen years old, who has painted a Saviour. Gave for it one florin. Great miracle that a woman could do so much." In the thirteenth and fourteenth centuries we had the nun Margit, Katharine Vigri and Onorata Rodiana; in the fifteenth and sixteenth centuries we had Propertia de Rossi, whose products in sculpture and painting were much admired by Michael Angelo and Leonardo da Vinci. Not less celebrated had been Barbara de Pazzi (later as nun known under the name of Mary Magdalen), who was said to have painted Saints with her eyes closed. The lecturer could not, however, vouch for the truth of this assertion. In landscape, women liked mild and gentle scenes with a tendency to the sentimental; in animal painting they equalled men: nothing could surpass the masterpieces of Rosa Bonheur; in flower-painting we had Rachel Ruysch, and in England Elizabeth Blackwell, Miss Gray, Miss Anne Ladd, Anne Lee, and Mary Lawrence. During the eighteenth century art had been much cultivated by court ladies, duchesses, and princesses. Amongst those high-born artists, who possessed more good will than power of execution, we had, in the times of Raphael Mengs, Crescentia Schott, Rosa Schindel, Julia Wermuth, Susan Drosch, Angelica Kaufmann, and Elizabeth Lebrun, who, though women, might be counted amongst the very best men of those times: for the time was the weakest period in the development of art history—it was a "namby-pamby" time. We must acknowledge that women who had become real artists were the very best daughters, wives, and the most tender mothers. They never forgot the broom, the frying-pans, the blankets and sheets—those indispensable adjuncts of a comfortable household, over their paint-brushes, colours, and canvas. Whenever women devoted themselves to a calling in which they could remain true to their still nobler calling as women they ought to be welcomed and encouraged. It was to be hoped that women would take with greater enthusiasm and in greater numbers to the arts of sculpture, engraving, etching, decorating, and painting. They would arouse in art clearness and freedom, intensity and fulness of composition, for we were sadly in want of poets in form, of novelists and dramatists in colour. Women would teach us to treat art like love, which sought its happiness in its own woe and bliss, its own sadness or joy, its own curses or blessings. Art in woman's hands would be a longing—contented to be a longing, an art contented to be art. She would devote herself to art like the nightingale to song. As long as women, either directly or indirectly, would influence art, art would for ever reflect in its undulating waves the glories and beauties of heaven, and gladden humanity with the highest aspirations of which mankind was capable.

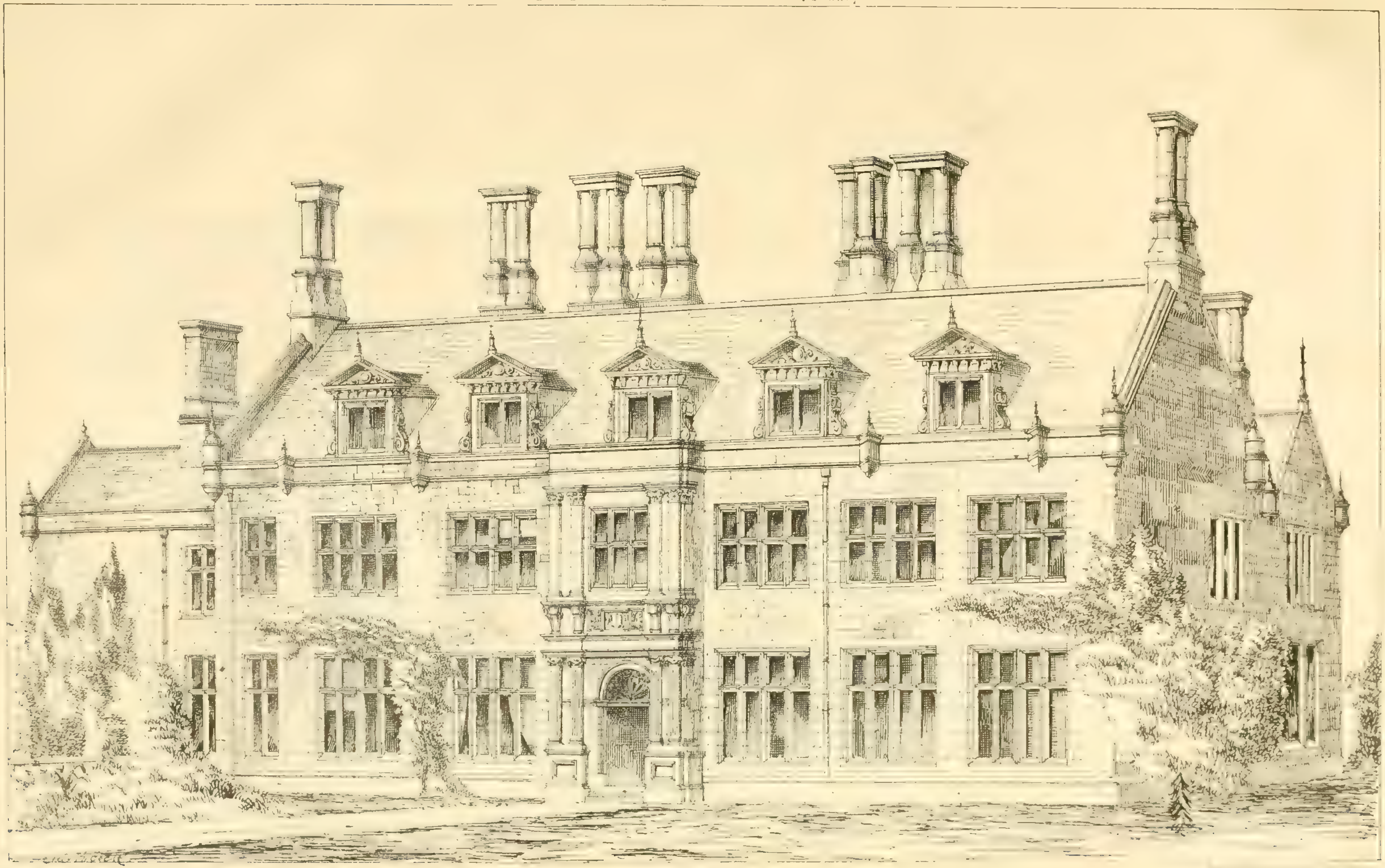
After a short discussion, in which Miss Taylor, Miss Emily Faithfull, Dr. Bickers, and Mrs. Howe (the presiding lady) took part, thanks were voted to Dr. Zerffi for his lecture, and the proceedings terminated.

THE SCHOOL BOARDS.

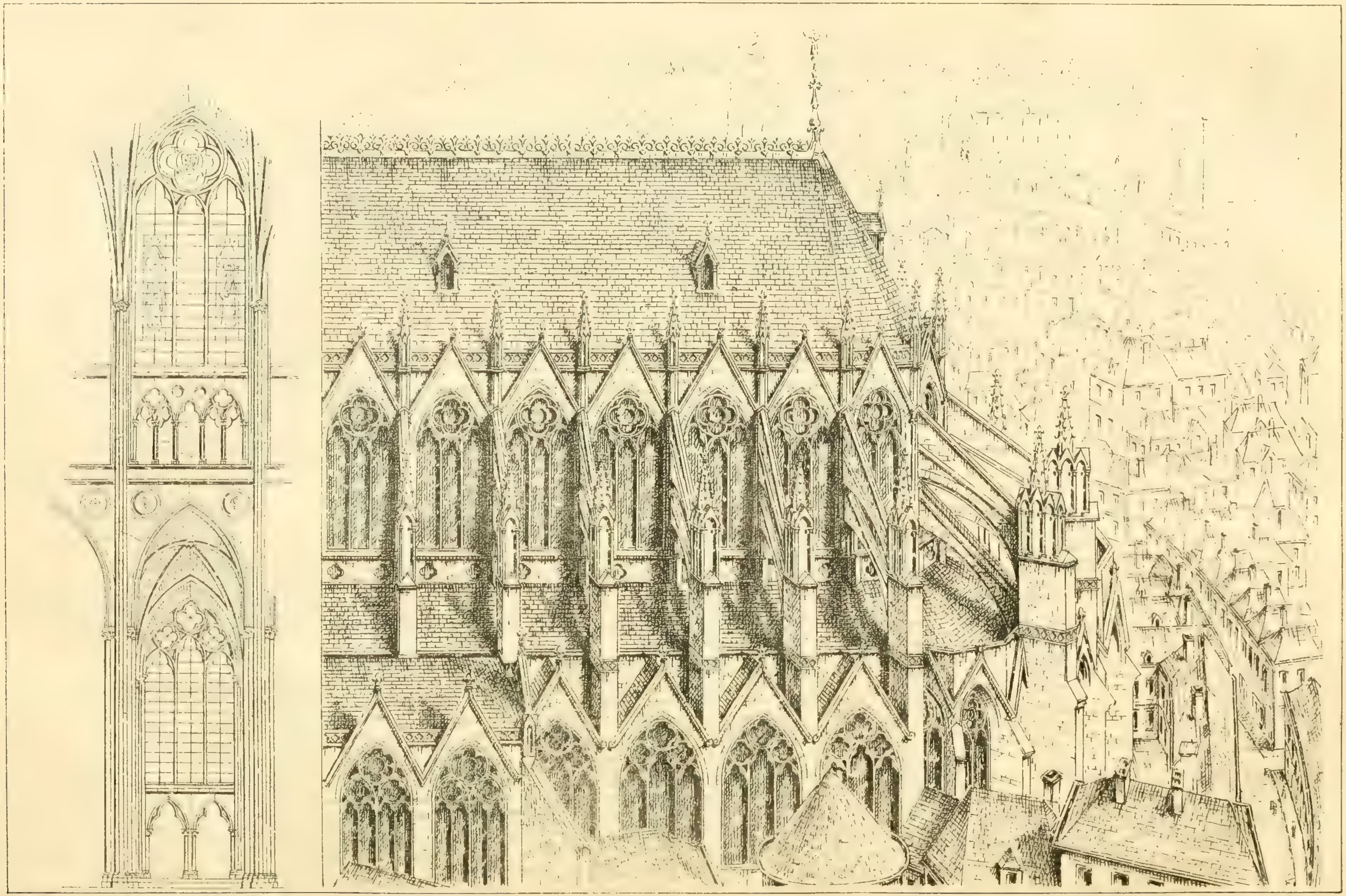
Brighton.—According to the *Brighton Daily News*, at the ordinary meeting of the Board, which met on the 18th ult., Mr. Stevens moved the confirmation of the following recommendation of the Sites and Works Committee:—"That subject to the sanction of the Education Department, design No. 6, sent in by Messrs. Banister Fletcher and J. S. Nightingale, for the new schools in Richmond-street and Sussex-street, at an estimated cost of £4,315, be adopted—both on account of financial considerations and because of its adaptation to the wants of the neighbourhood. On the whole, he thought the plan a good one and economical. The committee examined the plans, which were eight in number, without knowing by whom they were sent, and each member then placed them in order of merit according to his judgment. It was then found, singularly enough, that every one had put No. 6 first.

London.—A new school is to be erected for the London School Board on the site now occupied by Acre Cottage, New-road, Wandsworth, and another in Jamaica Level, Southwark. The purchase of the first named site has been agreed to for a cost of £1,605, and the purchase of the latter for £2,500. Mr. Jarvis, of Trinity-square, Southwark, has been selected as architect for the erection of a school in Old Ford-road. The Board have also invited designs from the following architects in competition:—For West Ferry-road, Millwall, 720 children, Mr. J. Young, junr., Messrs. Arthur & C. Harston, Mr. Phené Spiers, and Mr. John S. Quilter. For Blundell-street schools (Finsbury-street), Messrs. Arthur & C. Harston, Mr. Thomas Archer, Mr. Lacy W. Ridge, and Mr. T. R. Smith.

Rochester.—A special meeting was held in the Council Chamber on Thursday week. The Board at once formed itself into a committee for the purpose of considering the various competing plans, 27 in number, which had been sent in for the proposed new schools to be erected. After spending a considerable time in the inspection of the several plans, Mr. Aveling proposed, and Mr. Belsey seconded, that the one sent in by Mr. R. Walker, architect, of Moorgate-street, London, be adopted, the plan of Mr. B. Fletcher, Bedford-square, London, being second in point of merit. On a division the resolution was adopted, the designs sent in by Mr. Fletcher having only three supporters, Messrs. Hayward, Edwards, and Furrell. The board also commended the plan signed "Medway."



HOLDENBY · HOUSE · W· SLATER & R H CARPENTER ARCHTS



CHOIR, &c. OF TOURNEY CATHEDRAL.

MODERN ARCHITECTS AND THEIR WORKS.—I.

MR. THOMAS HENRY WYATT may be taken as the professional representative of what for brevity's sake is called the *Classic party*. But brevity, although the soul of wit, is very liable to call things by their wrong names. In fulfilment, therefore, of the promise we gave in our leading article for June 28th, we make our first plunge and take the liberty to strike out the word *Classic*, and replace it by the word *Palladian*. The term *party* has often been objected to, and an endeavour has been made to substitute *school*, but this change we cannot yet admit, for if there be such a thing as a modern school of architecture, its leaders and teachers are most assuredly the reverse of Palladian. Of this Palladian party, then, the first thing we have to notice is the strange admission by very many of them that their art is unequal to the wants of the age, and that for ecclesiastical purposes they must adopt the style of their opponents. Now in the whole history of the world there has never been a weaker admission. Imagine an architect living in the first days of Pointed architecture, always designing his secular arches pointed and his domestic gables high, suddenly making the one round and the other low. when called on to build a church, because, forsooth, those were in his day the characteristics of a past style which flourished in the very hot-bed of ecclesiasticism. Of course such a thing was no more possible to such a man than it is possible to be dead and alive, or sane and insane, at the same moment. You may borrow Gothic features as a thirteenth-century man may have borrowed Roman ones, but if you believe in yourself and your work, your are bound to Palladianise the one just as he Gothicised the other, and in so far that you do not, your principles are worthless, and your art is a sham and a pretension. To the young man who has nothing but his profession to support him, these words may sound extremely harsh. His employers, overflowing with twaddle about styles, and utterly ignorant of the art which creates style, dictate to him. He remembers how the schoolmistress dictated his first letter to mamma, how the letter was written over and over again in sorrow and spirit-crushing, and for his poor five per cent. he goes child-like to work, hoping for a time when money shall have been stored in quantity sufficient to enable him to take his stand as a man who is of age, and can answer for himself. There may be some sort of an excuse for such as these, although it would be far better in the end for themselves, for their art, and for the world, if they could summon courage enough to protest against dictation, and if needs be decline commissions that tend to degrade the architect from the position of the artist to that of the style-monger. But for those whose worldly position is secured there can be no excuse in their accepting any form of dictation whatsoever. In the eyes of their brethren and in those of the world, when it takes the trouble to look, such conduct is evidence of the spirit of him

> Whose welth was want, whose plenty made him pore,
> Who had enough, yett wished ever more.

If, on the other hand, the architect denies the dictation, and says "Of my own free will and choice, I do these things; I, a Palladian, build Gothic Churches, and like it;" or, "I, a Goth of the Goths, live in Palladianism and enjoy it," we warn our readers to mistrust him. He is no architect—he is but a surveyor dealing in the manufacture of curiosities, or, at the very best, a constructive antiquarian. That the architect of the Liverpool Exchange should be also the designer of the Memorial Church to George Herbert, and that the author of "The English Gentleman's House" could deliberately and seriously publish ten designs of a mansion in as many different "styles," are illustrations of what we mean, although it would have been more to the purpose if the attempts at reproducing Gothic forms had not been so sublimely ridiculous. Still more ridiculous is it to call such childish archæological exercises eclecticism. When you have learnt to feel the refinement of the Greek, the strength of the Roman, and the common sense of the Goth—when you can see how to harmonise principles without becoming a slave to precedents, then you may lay claim to the title of ecclectic. Mr. Wyatt, Mr. Kerr, and others of their party, would be more respected if, instead of complaining of the critics, they made an effort to see that for which the critics are contending. Let these gentlemen be but consistent—let them rest their case on its merits—let them adopt whatever principles they like, provided they adhere to them, and if they will but work (we care little what their *point de depart* may be), they will in time reach some sort of highway where progression is possible. As it is, we hardly think it fair to dissect such a work as the Liverpool Exchange, for in the presence of the Herbert Memorial Church we know not how far the architect has been his own master. So, too, with Mr. Kerr (and we mention him, not because of his works, but because his loquaciousness makes him prominent.) His most important building has windows with mullions and transoms, "remains evidently [at least so he says] of the Ecclesiastical character, and this is decidedly inconvenient in the eyes of the present generation."* Is not this enough to show the obliging shoppiness of modern architects, and how ready they are to wash their hands with invisible soap in imperceptible water? If our professors would talk somewhat less and learn more of art—if they would give to the studio even half the time they give to the counting-house, they might do more than a thousand Institutes and ten thousand congratulatory addresses to raise the position of architects and improve the condition of architecture. For in learning to be artists they would gather the strength and the right to say with Euripedes, "Good people, it is *my* business to teach you, and not to be taught by you." Whatever may be said in excuse or palliation, the dignity of art is perfectly incompatible with anything like dictation. If employers are to dictate to architects the sooner the latter give up all pretensions to the name of artists and call themselves surveyors the better it will be for the honesty of the profession. It is to us the greatest sign of a master when we are able to recognise his hand in all his works, but unfortunately for architecture most of its nominal masters have no hands to recognise. Such individuality as there may be is derived, sometimes from the employer, sometimes from the assistant, and sometimes even from the pupil, and we can often trace sorrowful partings in the melancholy that their masters exhibit in the intervals of their loneliness. Not that there is much to say in favour of these young Palladians. They attend a few classes, perhaps, and consort with one another occasionally in imitation of their elders for the ostensible purpose of discussing art or new books. Their chief merit is to be found in the fact of their youth and their consequent receptivity. The influence of the office is not what it used to be, and the promising Palladian youth not uncommonly shows his ingratitude by becoming a follower of some ultra-Goth who lives on cusps, and revels in stop chamfers.

E. W. G.

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THE STRIKE AND LOCK-OUT.

WE are sorry we are not able to report any satisfactory progress in the metropolitan building trades' struggle since we last went to press. The dispute broadens and deepens. Stronger feelings are animating the antagonists, and stronger words are uttered. Each finds fault with each. The masters blame the men, and the men return the compliment. The masters are blamed for treating the men with contemptuous silence in the first place, and the men are blamed for rejecting arbitration. The lines are drawn up, and the forces are fairly marshalled, and unless some fortunate turn takes place in the course of events, the struggle will increase in intensity and dimensions. The men, as we expected, have circularised the building trades of the country, and sent deputations to some of the principal towns. The masters have imitated the example set them, and appealed for co-operation "to the master builders of the kingdom." What is sauce for the goose is sauce for the gander. If the men are justified in soliciting assistance from the men in Birmingham, the masters are equally justified in soliciting aid from the provincial masters. If If the men could fall back on all England whilst the masters only relied on their strength in London, the masters would be put to a disadvantage. The masters, so far, however, do not ask pecuniary help; they only call on the provincial masters not to employ hands who have been locked-out in London. This conduct has been stigmatised by Mr. Broadhurst, the chairman of the Masons' Society, as "molestation," and "intimidation," and "illegal." It has been said that all things are lawful in love and war. There is now social war between the employers and employed in the metropolitan building trades. Men will do in times of war what they would not do in times of peace, and as the men were the aggressors in this instance—they gave the first blow—we don't see how they can reasonably complain of the conduct of the the masters in their desire to secure provincial co-operation. The mistake was in resorting to war at all. But force having been appealed to, it is not for the men to complain if it is used somewhat roughly. Like produces like. A blow provokes a blow, and the masters being put on their mettle, it may be expected that they will use the means that they can command. In this appeal for provincial assistance, the men have a substantial advantage over the masters. The masters do not appeal for monetary assistance, and if they did, we do not think they would get much. The men do appeal for such assistance, and are likely to get it liberally. Herein is a source of strength to the men—a source of strength which the masters cannot or will not see, and, not seeing, they are correspondingly weak. We have again and again stated that there is a solidarity of interest amongst the men which does not and which cannot obtain amongst the masters. The men of Manchester and Glasgow will assist the men of London willingly, because there is a fraternal sympathy between them. A fellow-feeling makes men wondrous kind. All the men have the same amount of wages. They are, in fact, on an equality of privilege. They eat pretty much the same quality of food, enjoy pretty much the same quality of amusement, and are influenced pretty much by similar motives. The masters are great and small, some living in little houses, and others living in mansions; some working with their own hands more or less, and others attended by flunkeys and faring sumptuously every day. Hence the masters, being subject to different kinds of pressure, enjoying, or living in, different social positions, and animated by different qualities and quantities of ambition, do not hang together as the men can and do. The men enjoy another advantage which the masters in a struggle of this sort never dream of possessing. The members of the same trade not only hang together, but there are ligaments of sympathy running through the whole brotherhood of workmen. The masons of Bristol will voluntarily subscribe to assist the masons of London. But that is not all. The brass-founders and hatters of Bristol will, if need be, assist the masons of London. And this is not all. There are international sympathies at work as well. Workmen in Berlin and Brussels are prepared, in a somewhat remote degree, to assist the masons of London. And this kind of feeling is growing. It is gradually taking root, something like a new faith in the history of the world. Only imagine the sugar-boilers of Bristol or the mustard-makers of Norwich putting their hands into their pockets to assist the master builders of London in a strike! Though, according to the law and usages of war, the masters were justified in appealing to provincial masters to lock-out all who have been previously locked-out in London, we do not think it good policy to ask it, or for the provincial builders to enforce it. If they do, the contest, which is wide enough at present, will be made wider still. There is another clause in the circular of the London masters which we are somewhat surprised should ever have been made. The lock-out masters, through their secretary, Mr. Bird, say: "The proposal to reduce the present working hours, at the least during the summer months, appears to the committee to be a wanton interference with the productive powers of the country." How little the masters know of the motives of the men to use such an argument as this. The men say that the productive powers of the country are not now fairly used; that one man at least out of ten is almost always out of employ, and that it is better for all that all the ten men should be employed nine hours a day than that nine men should be employed ten hours a day. If all men were employed the matter would assume a very different aspect. If the whole productive forces of the country were in full activity the present strike for shorter hours would never have commenced. The last man we had a conversation with on the subject said: "In our shop, when there were thirty benches idle, the foreman came one day and said that for some time we should have to work overtime. There being so many vacant benches we refused, and if we were not united we should have had 'the sack.'" The demand for the nine hours' work is not to limit the productive forces of the country, but to so direct them that a greater number shall participate in their benefits. Masters, as a rule, cannot sympathise with this feeling. Absorbed in a fierce competition, in which every one tries to distance his neighbour, they have little time or inclination to think of matters of humanity, and they don't think the men are sincere when they talk about such things. The masters, however, are mistaken. We believe the men are inspired by a deep desire to benefit their fellow workers, and their chief motive in this contest is not so much increased wages as shorter time, so that they and all their craftsmen may have a fairer chance of winning bread. Doctrinaires and political economists may say what they like; there is, deep down down in the hearts of the working men of this country, a sympathy for each other. Take away this sympathy, and a social convulsion such as never shook England would be the consequence. The poor assist the poor to a much greater extent than the world generally believes. The nine hours' movement springs to a great extent from this inexhaustible fountain of fraternal feeling which every now and then surges up from the national heart. If masters were working men they would speak and act as working men do. If men were masters they would do as masters do. They now throw the blame on each other when both are partially blameworthy; hence the strike and the lock-out, and the train of evils which inevitably follow. What, then, is to be done under the circumstances? Our advice is the same now as heretofore. Let the masters concede the point as to time, and let the question of wages be settled by negotiation. After all that has been said and done, we see no solid reason why this basis of a settlement may not be adopted at once.

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* "English Gentleman's House," p. 347, 3rd Edition, 1871.

J. P. E.

PRIZES AT UNIVERSITY COLLEGE.

PROFESSOR LEWIS presents his compliments to the Editor of the Building News, and regrets that owing to his unavoidable absence from the Prize Distribution at University College, the enclosed list of the students who obtained prizes in his class was not sent last week.

Architecture, Junior Class.—W. G. Field, 1st certificate and prize; P. Warne, 2nd ditto.

Senior Class.—F. E. Eales, certificate and medal.

Architectural Construction, Junior Class.—F. P. Johnson, 1st certificate and prize; W. H. Lloyd, 2nd ditto; C. C. Ogle, 3rd ditto.

Senior Class.—W. H. Lloyd, 1st certificate and medal; F. P. Johnson, 2nd ditto; F. A. Butler, 3rd ditto; P. Warne, 4th ditto.

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ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Meeting of the Archæological Institute at Southampton.—The meeting of this Society takes place this year at Southampton, commencing on Thursday, August 1st, and ending the Thursday following. The Bishop of Winchester has consented to act as president of the meeting, and the following gentlemen as presidents of sections:—Antiquities, Sir E. Smirke; Architecture, Mr. A. J. B. Beresford Hope, M.P.; and History, Lord H. Scott. The meeting promises to be one of great interest, the town and neighbourhood of Southampton offering a most worthy centre of operations for such a society, being rich in historical associations. Few towns have preserved more of their Mediæval aspect. Many objects of great archæological interest are to be found, both in its immediate vicinity and in neighbouring towns, among which the ruins of Netley and Beaulieu Abbeys, the remains of the Roman castellum of Clausentum, and other relics of the past, may be mentioned. A temporary museum will be formed at the Hartley Institution.

The Royal Archæological Institute at Guildford.—On Tuesday last, at 11.30, a party under the guidance of Mr. J. Burtt, the honorary secretary of the Royal Archæological Institute, left Waterloo Station. At 12.23 they arrived at Guildford, and at once proceeded to S. Mary's Church, where Mr. J. H. Parker, C.B., gave a discourse on the edifice, which he considered one of the most curious and interesting examples of work composed of chalk and flint. The earliest portions of the building he attributed to the time of William I. From the church the party proceeded to Archbishop Abbot's Hospital, when Mr. Parker again acted as cicerone. The company lunched at the Angel—an old inn with a new front—and here the Mayor of Guildford welcomed them. At three o'clock they were on the ancient mound crowned by the castle. Here Mr. G. T. Clark addressed the company, giving an admirable account of the remarkable fortress round which they stood. The castle, though of great age, has played no great part in English History. The internal evidence of the buildings of the castle makes it most probable that the whole of it, keep, hall, and domestic buildings, with its *enceinte* wall enclosing above five acres, was constructed by Henry II., very early in the reign; but the castle is not mentioned in his reign, nor in that of Richard I. In the Pipe rolls the town appears from time to time as contributing to tallage and other imposts, and in 1 Richard I. the park is named in connection with the canons of Sarum. It also appears from the Rot. Curiæ Regis, 6 Richard I. that an assize was held there. Henry II., probably when he built the castle, seems to have formed a royal park on the opposite side of the river, north of the Hog's Back, the site of which is still indicated by such names as Guildford Park, Wilderness, Stag Hill, and the Manor Farm, the latter being probably the site of the royal lodge. After Mr. Clark had given a description of the structure, the whole party proceeded to the remarkable series of caverns in the neighbourhood of the castle, and running under the southern edge of its *enceinte*. These are excavated in the chalk. Mr. Clark thought they certainly are not of British origin, as usually supposed. The plan of the workings excludes this view. No doubt they might be Roman, but there are no traces of Roman buildings in the neighbourhood, and chalk, even hard chalk, is too plentiful all along the ridge to be carried hence to any great distance. The most probable supposition seems to be that they were opened by the builders of the Norman castle, who used chalk largely for their inner and, indeed, for much of their more exposed work. The quarries have no communication with any part of the castle. Where they infringe upon its borders they are far too deep to have been employed against it during a Mediæval siege. The company reached London shortly after six.

Building Intelligence.

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CHURCHES AND CHAPELS.

Brixham, Devon.—A local paper says this church is destined to come down sooner or later, as it deserves to do, on account of its ungainly appearance. A new apse has recently been added to the church. The walls are of local limestone, and the dressings throughout are of Bath stone, from the Corsham Down quarries. The builders are Messrs. Bragg & Dyer, of Paignton. The sculpture and the stone carving is by Mr. Harry Hems, of Exeter. The style of the building is Early Decorated, and has been designed by Mr. E. Ashworth, of Exeter, under whose supervision the works have been carried out.

Bury.—The new Church of S. Peter, Bury, was consecrated on Saturday last by the Lord Bishop of Manchester. The church is in the Early English period of architecture, faced with stone externally, but with red brick of a very fine colour inside, Bath and blue Burnley stone being used in the columns, &c. The reredos, font, and pulpit are executed chiefly in alabaster, relieved with gold mosaic. An unusual effect is gained in the interior by the contrast of the seating—which is black—with the colouring of the walls and columns, &c. The stalls are relieved by gilding. The church is built to accommodate 500 persons on the usual plan of nave and aisles, with apsidal chancel, large organ chamber, and two vestries. The remainder of tower and spire are left for future erection. The contractors for the building are, for the mason work, Mr. Henry Fleetwood, Manchester; brickwork, Messrs. Thomas Blease & Brother, Altrincham; joiners' work, Messrs. William Jones & Co., Liverpool; slating, &c., Mr. Joseph Owen, Bowdon. The reredos, pulpit, font, and the carving of chancel, have been very ably executed by Messrs. E. Williams & Millson, City-road, Manchester. The architects are Messrs. Maycock & Bell, of Bond-street, Manchester.

Derry.—The new Church of S. Augustine, Derry, has been consecrated. It is in the thirteenth century style, and consists of a narthex 21ft. by 6ft. 6in., abutting on the western façade, and a nave 60ft. by 21ft. with chancel extending to the limit of the former eastern gable. The walls, externally, are faced with Creevagh stone, and the windows, doorways, tracery, and bell-turret are of stone, supplied from the Dungiven quarry. Variety has been secured in the dressings by using a red sandstone for the quoins, supposed to have been brought from quarries near Redcastle, on Lough Foyle, and which was found in considerable quantities in the old building, in a good state of preservation. The design has been carried out under the superintendence of Mr. John Guy Ferguson. Messrs. G. & R. Ferguson were the contractors.

Edinburgh.—On Monday the foundation stone of a new United Presbyterian Church was laid at Edinburgh. Mr. Starforth is the architect, and the design is Early English. The plans show an elevation consisting of a large central gable, flanked on the east by a tower and spire, and on the west by another tower of smaller dimensions. The towers are pierced with doorways, which appear in the east and west elevations respectively, and each contains a staircase giving access to the gallery of the church. The north end of the church, so far as not hidden by certain subsidiary buildings, shows a large gable pierced by a couple of three-light windows. The building will accommodate about 1,000 persons.

Enderby Church, Leicester.—The whole of the interior of this church has recently been decorated at the cost of Charles Brook, Esq., of Enderby Hall. The designs and plans, which comprise the entire decoration of the chancel and chancel arch, also scrolls with legends over the windows and nave arcade, were prepared by the architect, Mr. Edward Birchall, of Leeds, and the paintings and decorations have been carried out by Powell Brothers, of the same town.

Primrose Hill.—On Tuesday the new church of S. Mary, Primrose Hill, was opened. The building, cruciform in plan, is in the style of architecture which prevailed in Western Europe during the thirteenth century—built inside and out of red brick, with stone windows devoid of tracing proper, and wide and lofty nave with open timber roof. The chancel, 38ft. by 23ft., terminating in an apse, has a brick vaulted ceiling. The floor is of rich encaustic tiling, with steps of Devonshire marble leading up to the altar. The church, when completed, with south aisle, transept, and chapel, will seat between 700 and 800 people. The building has been erected from designs by Mr. M. P. Manning.

Rochdale.—The new church of S. Mary, Balderstone, Rochdale, was consecrated on Monday last by the Bishop of Manchester. The site of this new edifice adjoins the main Oldham-road, and the style of architecture is the Decorated Gothic. At the north-west corner is a steeple, with a tower and spire rising to a height of nearly 150ft.; and under this is a porch forming the main entrance to the church. In the spandrels of the nave arches there are six medallions, three on each side, containing the following subjects: The Annunciation; the Birth of Christ; S. Mary finding Christ in the Temple; the Marriage in Cana; Christ commending His Mother to the care of S. John; and the Deposition from the Cross. At the west end are two similar medallions containing two subjects symbolical of baptism: the Passage of the Red Sea, and the Ark. The gas-fittings are by Messrs. Hart & Co., who have also executed the lectern and pulpit-desk. There is a peal of eight bells by Messrs. Mears & Co. The reredos, pulpit, and font are by Messrs. Earp & Co.; and the medallions and the rest of the carving by Mr. Evan Williams. The coloured decoration is by Messrs. Best & Lea. The heating apparatus, by hot-water pipes, is by Mr. Walker. The general contractor is Mr. Mark Foggett, who has carried out the work from the designs and under the superintendence of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Southampton.—The Church of S. Michael, Southampton, was reopened on Thursday week after restoration. The whole of the galleries have been removed, and the walls stripped of their plaster. A new pulpit has been erected, and the whole of the building repaved and reseated. A vestry in the north-eastern corner of the church has been converted into a chapel, and is separated from the high altar by a dwarf Bath stone wall, surmounted by a light iron railing. The cost of the work accomplished is about £1,000. Mr. J. Sanders, of Southampton, was the builder.

BUILDINGS.

Accrington.—The new schools in connection with the Church of S. John the Evangelist have just been opened. The building, which assumes the shape of the letter E, comprises boys', girls', and infants' schools and class-rooms. The boys' school is 44ft. 6in. by 20ft.; boys' class-room, 20ft. by 15ft.; girls' school, 61ft. by 20ft.; girls' class-room, 24ft. by 15ft.; and infant school, 41ft. by 24ft. The height of the building is 12ft. 3in. to the wall plate, and 19ft. to the ceiling. All the schools are lighted by two-light windows of rough plate-glass, and there are iron ventilators in the windows. Ample provision is made for ventilation both in the ceiling and floor. The roof is open-timbered, ceiled at the collar with plaster between the spars. The whole of the roof and other woodwork is stained and varnished. Contiguous to the building are two spacious play-grounds, fitted up with McFarlane's drinking fountains. The school is heated with hot water. Leading to each school-room are porches, which also serve for cloak-rooms. Both externally and internally the school has a finished and artistic appearance. It is in the Gothic style of architecture. The cost of the schools is £2,330, and they will accommodate about 600 scholars. Mr. W. S. Varley, of Blackburn, was the architect, and the work was executed by local contractors in each trade.

Bedford.—A large mansion, from the designs of Mr. John Usher, of Bedford, is now in course of erection at Clapham Park, near that town, for James Howard, Esq., M.P., for Bedford, and a partner in the well-known firm of agricultural implement makers. The building stands upon slightly elevated ground in the midst of the park, and commands a magnificent prospect. It is built entirely of red brick, with dressings of Hare Hill stone, and is Early French Domesticated Gothic in general treatment. The house is carried well up, somewhat higher, in proportion to its ground plan, than are mansions of this class generally, and now that during the past fortnight the whole of the scaffolding has been taken away the general effect is seen to advantage. The principal entrance is on the north side, where there is a large groined porch. Fareham bricks are used throughout the building, the cut bricks being from Cossey, near Norwich; the cut work of the chimneys and the other parts of the building come out well and are very successful. The tiles are Burslem ones, of varied shape and hue, the roofs being steep in their pitch these show out to advantage. The staircase is of oak, and is well lighted by a lantern, carried by an arcading of Bath stone, around which is a corridor communicating with the upper rooms. There are four bays on either side, the arches being supported by columns of red Mansfield, upon which are foliated capitals; the arch moulds are also enriched with running enrichment. The encaustic tiles are by Mr. J. K. Cooper, Tile and Pottery Works, Maidenhead, The arrangement in the basement, whereby the chimneys of the principal rooms may, at any time, be swept and the soot carted away without the sweeps entering the building—thus saving a vast amount of dirt and muddle—is worthy of attention, and will be shown and explained by Mr. Deacon, clerk of works. The stables and coachman's house are well removed from the main building, and are built in character with it, save only that the bricks are local ones, not quite so regular in colour as the Fareham brick. Mr. Samuel Foster, of Kempston, near Bedford, is the contractor, and Mr. Dennis is his foreman on the works. The carving is in the hands of Mr. Harry Hems, of Exeter. The cost of the whole of the works will probably be about £17,000.

Liverpool.—New offices have just been completed for the Liverpool Gas Company. The style is Renaissance, of a French character. The exterior is plain, but the internal arrangements are of a very complete character. Messrs. Jones & Son, of Liverpool, are the contractors, and Mr. H. Littler the architect.

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THE INSTITUTION OF CIVIL ENGINEERS.

The Council of the Institution of Civil Engineers have just awarded the following premiums for papers read at the meetings during the session 1871-72:—

1. A Telford Medal, and a Telford Premium, in Books, to Bradford Leslie, M. Inst. C.E., for his "Account of the Bridge over the Gorai river on the Goalundo Extension of the Eastern Bengal Railway."
2. A Telford Medal, and a Telford Premium, in Books, to Carl Siemens, M. Inst. C.E., for his Paper on "Pneumatic Despatch Tubes: The Circuit System."
3. A Telford Medal, and a Telford Premium, in Books, to William Bell, M. Inst. C.E., for his Paper "On the Stresses of Rigid Arches, Continuous Beams, and Curved Structures."
4. A Telford Medal, and a Telford Premium, in Books, to John Herbert Latham, M. Inst. C.E., for his description of "The Soonkêsala Canal of the Madras Irrigation and Canal Company."
5. A Telford Medal, and a Telford Premium, in Books, to George Gordon, M. Inst. C.E., for his Paper on "The Value of Water, and its Storage and Distribution in Southern India."
6. A Telford Premium, in Books, to Frederick Augustus Abel, F.R.S., for his Paper on "Explosive Agents applied to Industrial Purposes."
7. A Telford Premium, in Books, to Bashley Britten, for his Paper on "The Construction of Heavy Artillery, with reference to Economy of the Mechanical Forces engaged.
8. The Manby Premium, in Books, to Charles Andrews, M. Inst. C.E., for his Paper on "The Somerset Dock at Malta."

The Council have likewise awarded the following Prizes to Students of the Institution:—

1. A Miller Prize to Oswald Brown, Stud. Inst. C.E., for his Paper on "Sewage Utilisation."
2. A Miller Prize to Arthur Turnour Atchison, B.A., Stud. Inst. C.E., for his Paper on "Railway Bridges of Great Span.
3. A Miller Prize to John Addy, Stud. Inst. C.E., for his Paper on "The Most suitable Materials for, and the best mode of Formation of, the Surfaces of the Streets of large Towns."
4. A Miller Prize to Alfred Edward Preston, Stud. Inst. C.E., for his Paper on "Wood-Working Machinery."
5. A Miller Prize to William Patterson Orchard, B.E., Stud. Inst. C.E., for his Paper on "The Education of a Civil Engineer."

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SCHOOLS OF ART.

Schools of Art in the Potteries.—The Schools of Art in the Potteries have this year been very successful in the examination of works sent to South Kensington. Hitherto the district has not reached the dignity of a gold medal award, but this year two have been taken—one by Hanley, and the other by Stoke School. The gold medal for Hanley is awarded to Joseph Ellis, for modelling; and that for Stoke to Robert Abraham, for painting from nature. Hanley School also takes two silver medals and three Queen's prizes, and seven pupils have free studentships, besides which the works of twelve students are selected for national competition. Nearly double the number of students have been successful this year in comparison with last year. Besides the gold medal, Stoke School has been awarded a bronze medal and eight free studentships. In the case of Stoke, also, there is a great increase in prizes over last year. The monetary results of the examination to Hanley School are 40 per cent. in advance of last year.

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The Chelsea Vestry have fined their dust contractors for the B division £150 for neglect, and have decided to hire carts and remove some of the dust themselves at the contractor's expense.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Received.—E. G. H.—W. H.—H. B.—J. P. S.—W.—D. C.—C. B. A.—S. & S.—P. J. W. & Co.—P. Brors.—J. M. Dale.—H. M. F.—T. H. W.—Prof. L.—J. P. S.—R. W.—C. F. H. & Co.—J. F. & Co.—M. & Co.—C. L.—J. T. & Sons.—T. W.—J. A. L. & Co.

Fred. C. Deshon.—The drawings are in hand.

Ed. Biven.—Plan to hand.

H. L. E.—The question is, did you make the apparatus *before* it was patented by another? It is not enough for you to say you invented it. What bonâ-fide record have you to prove it?

W. thinks that the suggestion of "Libra," in reference to each competitor paying 3s. towards a third prize, a poor one, and he hopes it won't be acted on.

Walter Emden.—The photo. of fountain in Dublin Exhibition to hand.

F. Thompson.—Thanks for offer to use drawing of doorway, which is good; but we are overstocked with drawings of old work, and are obliged to decline.

David MacLaren.—The plan came to hand.

T. W. Grindle.—Thanks for invitation to see the experiment on "the lime process." Please send short account.

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Correspondence.

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THE BRITISH ARCHITECTS AND THE CONFERENCE.

To the Editor of the Building News.

Sir,—It is very delightful and refreshing for persons who desire the prosperity of the architectural professsion to read the preachments in favour of "unanimity," and so forth, put into such burning words by "E. W. G." and "J. P. S." But why did not these disinterested enthusiasts come to the Conference and help to be unanimous? That would, perhaps, have been more to the purpose.

I think the tone taken about the whole affair by some of your correspondents anything but creditable, either to their feelings or understandings. They seem to be indignant because the Institute, which only numbers a limited proportion of the actual practising architects of the kingdom, endeavoured to inaugurate a movement which should be for the good of the whole profession, if possible. I was one of the stupid and misguided provincials who came up to see what was going on, and certainly brought away an impression that there was on the part of those who organised the meeting a sincere desire to do something to benefit and improve the position of the profession, and that it was a great pity their labours were not more heartily seconded. The alteration of the already recognised scale of charges was certainly a mistake, but the rules for regulating competitions were such as, if adopted and acted on by the whole of the profession, would go far to do away with the evil influences of competitions; and if "J. P. S." had taken the trouble to ascertain facts before making his growl, he would have discovered that so far from "affirming the principle of competition," a special sentence was introduced into the heading of the "rules," implying that competitions were essentially undesirable, but that if the public *would* have them here were the terms they must take them on. And if we could get even as far as that it would be a great step in securing our own interests.

The awful charge brought by your "Young Architect" correspondent under the heading "Secret Deliberations" (!) amounts really to this, I believe: that after the way in which some architects have been treated by public bodies of late, in regard to their professional claims, it was not thought for the interests of the profession that all the *pros* and *cons.* of the discussion should be made public, to form ground for further extortions on the part of unreasonable clients. We were never told that the discussion was not to appear in the official report of the Conference. Another blunder one of your correspondents makes was made over and over again at the meetings: he seems to imagine that the Institute, as such, was laying down the law. The contrary was repeatedly explained; the Institute merely took advantage of its central position to convene the meeting, and arrogated no more authority than any other architectural body represented at the Conference; the President pointed this out more than once, but some people's heads are so very thick.

As long as the tone and temper displayed in the two letters referred to exists, it is not likely there can be unanimity; and if the writers and their clique would put some of their prejudices and self-assertion on one side, and join their professional brethren in the spirit of mutual courtesy and good feeling—which they may find examples of quite worth their imitation in those who differ from them on artistic grounds—they would be doing far more good, even from their own point of view, than by "dwelling apart" like stars, and then shooting forth all these dire and exaggerated prophesyings against well-meaning persons, who would be quite ready to respond to them if they would only show a little more of that universal charity and good will which they affect to deplore the want of.—I am, &c.,

Another Provincial Architect.

S. AUSTELL CENTRAL SCHOOLS.

Sir,—Referring to "H.'s" criticism in last week's Building News on the disposition of light in the plan for the S. Austell Central Schools, I may observe that any architect understanding school-planning will perceive that one important reason influenced my arrangement of the windows in question—viz., Rule No. 4 of the Education Department's regulations, which distinctly says: "The doors and fireplaces in school-rooms for children above seven years of age must be so placed as to allow of the whole of one side of the school-room being left free for the groups of benches and desks." Consequently, on the side opposite the desks should the fireplaces be placed, if rooms of the length of those in question are to be equally heated, and as class-rooms are to be on the same level as the school, and should be entered immediately from it, they must necessarily be placed at the side opposite the desks, or at the end of the main school, and in the case in question could not be placed at the end on the same level without much additional expense; now, considering the portion of side of school in question occupied by doors and fireplaces, how much more available space is there than what I have utilised by windows?

I fail to observe that "a proper disposition of light is entirely ignored," for it may be noticed that the boys' class-room is so placed that light is obtained from the side in front of the children in each school. There are two other features in the lighting in plans in question which "H." must have failed to have considered—viz., 1st., the quantity of light or superficial area of glass in proportion to the area of rooms; and 2nd., the height of same above the "floor line."

I might also draw "H.'s" attention to the fact that three out of the four plans for schools issued by the authority of the Education Department are principally lighted by windows placed behind the groups of desks.—I am, &c.,

Par Station, Cornwall, July 2. S. Trevail.

"ON MODERN SCOTTISH ECCLESIASTICAL ARCHITECTURE."

[The following has been sent to us for publication by Mr. Gildard, the writer of the letter in our last week's impression.—Ed.]

My Dear Gildard,—You have misquoted me in your letter to the Editor of the Building News. What I said regarding the predisruption of the United Presbyterian Churches was, "They were always unobtrusive and *generally* unadorned." It is evident from your remarks that you have overlooked that word. I had several United Presbyterian churches in my mind when I used it; and I may mention that I exhibited as worthy of commendation the best photograph I could procure of Wellington-street United Presbyterian Church as that of a noteworthy example of a modern Presbyterian place of worship.—Believe me, yours very truly,

Glasgow, June 29. John Honeyman.

SCHOOL PLANNING COMPETITION.

Sir,—Your correspondent "H." asserts, in a somewhat dictatorial tone, that in the planning of schools a proper disposition of light is entirely ignored by placing the light at the backs of the children, and that the windows in such positions are exactly where they ought not to be. It is to be regretted that "H." did not append his real name and address in order that your readers might judge how far his opinion is entitled to weight, as I venture to say that many architects do not concur in his view, and that in the recent School Board Competitions the greater part of the designs had the windows arranged in the very position that your correspondent appears to think so faulty; but if he can give weighty reasons for the opinion he expresses, his experience and scientific opinion upon the proper lighting of schools will be very acceptable, especially as so many gentlemen are now competing for school buildings.

Now, in the proposed "School Planning Competition" it would be fatal to many a good plan if your correspondent's opinion is shared by the judges, and perhaps some of the gentlemen who are now employed to carry out their designs (selected in competition by the School Board of London) may be induced to favour your readers with their views on this most important subject, and to state particularly which position they consider the best for the windows when it is only possible to get them on one side of the school-room.—I am, &c., T. P.

Sir,—It will be well if the competitors in your proposed school planning competition distinctly understand one point which appeared to be disregarded by some of the authors of the published plans for the villa and mansion competition—viz., what is required to be shown on a section. Some of the plates show merely the construction of the roofs, roughly, and the sections of walls, partitions, and floors, whilst others of the authors of these designs have taken the trouble to show the interiors of the rooms, exhibiting in some cases even the stained glass. Looking at this as an outsider, one method seems hardly fair to the other, and if no definite regulation can be made, the completeness or incompleteness of the drawing ought surely to have some weight in deciding the award. It is generally complained of that even amongst the best of school designs there are deficiencies, but there is hardly one portion of the plan which is so greatly overlooked as the master's house, when there happens to be one. The general notion appears to be that a small cottage, just suitable in size and convenience for that of a country labourer earning about 15s. per week, is quite sufficient, and the expense saved by so arranging it enables the architect to please his fancy and improve the appearance of his drawings by bestowing it on the front, perhaps in a pretty porch, a few gurgoyles and carved finials, or some ornate chimney-stacks. Now, these embellishments are by no means to be deprecated if the conditions as to cost will allow them, or if their possession requires no cutting down anywhere else, but it is surely not too much to suppose that a master having the charge of probably from 300 to 400 children, and receiving salary accordingly, should require a little more accommodation for himself and family than that afforded by the class of houses usually erected. There should at least be a study, independent of the ordinary parlour and kitchen, &c., and besides the three bedrooms usually given—one for an assistant or pupil teacher—a passage-way also from front to back, without interfering with any of the rooms. These, in the majority of cases, prove to be absolute requirements; nevertheless, they seldom receive any attention.

As in your other competition there were two subjects given, so in this one proposed it might be desirable to have designs for the two styles of schools most usually required—viz., (1) Schools on a confined site, where they would have to be arranged in two or more stories, and to be treated as a building, rather than as buildings, as in the centre of a large town; and (2) schools in a suburb or country district on a large site.

The suggestion of "Libra" that each competitor should subscribe a sum towards an extra prize will not be so well regarded by all as by himself, perhaps. There is scarcely a necessity, with the kind offer of your prizes in view, for a competitor to go to any greater expense than the necessary one connected with preparing the drawings.—I am, &c.,

Edwin Seward.

Tredegarville, Cardiff, July 2.

Sir,—I venture to suggest that all drawings should be on the uniform scale of ⅛in. to the foot. Schools should be one story in height (what I observe is always preferred outside of crowded cities and towns). There should be a convenient master's house. Number of rooms should be given. Also that excessive ornament should not be encouraged; that the buildings should be neat, efficient, and substantial; that the amount of accessories to be provided, such as lavatories, cloak-rooms, water-closets, entrances, &c., should in some manner be specified, as well as the quantity of class-room accommodation. Schools should either be of brick or stone, at the discretion of architect. Size of schools, of course, should be given: 600 mixed would be good; and as "H." observes, rules of Education Department should be strictly adhered to. Perspective views should either be given or omitted, at discretion of each competitor, and not made absolute.

The matter of cost should also be considered, but the comparative cost of designs one to another would be better left to the judgment of the judges, as prices vary so much with the situation of different places.—I am, &c.,

Par Station, Cornwall. S. Trevail.

Sir,—In regard to the school planning competition, I think it would be advisable to give the proposed conditions in an early number, and, at the same time, invite any suggestions or amendments on them, and if found necessary they could be altered. I think the competition should be for a school planned to suit the requirements of the Committee of Council on Education for 100 infants, 200 boys, and 200 girls. It would be a mistake to make the sending of perspectives binding, and thereby prevent, from lack of time, many who otherwise would compete, and since the competition is for planning, and not for artistic treatment.—I am, &c.,

Aberdeen. An Intending Competitor.

Sir,—Your correspondent "H.," in enumerating "the chief features for consideration" in preparing plans for your proposed school competition, "says above all, compliance with the rules of the Educational Department is necessary."

Would it not be advisable to leave this to the discretion of the competitors? Most architects who have had experience in planning schools must remember that the Council of Education formerly insisted that no school should be more than 18ft. or 20ft. wide. This idea has now quite exploded, and it seems probable that many of the instructions issued by the London School Board, and some contained in the Education Act, will be found not to work when the exigencies of site are considered. For instance, the London School Board have selected one design planned entirely on the Prussian system. Now, this design can be scarcely said to comply with the instructions issued. The suggestion that each competitor should subscribe 3s., to be added to the prizes kindly offered by you will, I should imagine, be gladly accepted.—I am, &c.,

John T. Lee.

66, Mortimer-street, Cavendish-square, July 1.

Sir,—While glad at the signal success of the "house planning" competition, I am again well pleased to observe that your endeavours in this good direction are not to cease.

Regarding the proposed school planning competition, might I respectfully suggest that you should publish an imaginary piece of ground with the extent of the various boundaries marked on, and invite competitive plans to suit such a site. I would also propose that the plans to be submitted to you should include a ground plan, a "block plan" (to a small scale), showing the relative positions of the buildings and offices, &c., two elevations and a section—a perspective view to be optional; and that "planning" (as in the house competition) should be the principal feature by which the plans are to be judged.

Might you not also request each competitor to subscribe one shilling, which would amount to £5—this is on the supposition that the number of competitors will be about the same as in your former competition—and thus, by this means, a prize additional to those so generously offered by yourself would be subscribed; this premium to come after the "Editor's prizes," and be designated as the "Draughtsmen's prize."—I am, &c.,

Glasgow. Maclarenda.

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With reference to the Building Companies Bill, it is stated that Mr. Bruce has written a letter to the effect that the Government are of opinion that these companies should be registered under the Friendly Societies Acts. This decision, if it be a final one, may, it is thought, lead to the withdrawal of the Bill.

The death of the well-known German artist, J. G. J. Schnorr von Karolsfeld, is announced. This painter is known in this country by a popular series of "Bible cuts," but his reputation in Germany is based on the large frescoes, representing many of the incidents in the Nibelungen-Lied, which are in the ground-floor of the New Palace at Munich, and by those in the Fest Saalbau, which deal with the histories of Charlemagne, Frederick Barbarossa, and Rudolph of Hapsburg.

The foundation stone of a new Wesleyan Chapel and Schoolhouse has been laid at Athy. The cost, including purchase of site, will be about £2,000. The plans have been furnished by Messrs. Darley & Holdbrook, Great Brunswick-street. Mr. Wm. Faircloth is the contractor.

Intercommunication.

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QUESTIONS.

[2598.]—**Shoring.**—A pillar, supporting the springings of four arches, shows signs of giving way under the immense superincumbent weight. Some of the stones are cracking in a manner which demands instant remedy. Will some fellow reader tell me of an efficient system of shoring which will allow the weak stones to be taken out and replaced by others?—One in Need.

[2599.]—**Strength of Wood.**—In Tredgold's "Carpentry," by Hurst, are tables on the cohesive force of different woods, one of which is taken from the *Philosophical Magazine*, 1826. Could some one explain to me the great disparity shown in these tables? The woods were in all cases, I suppose, as sound as could be obtained—

Wood.	Specific gravity.	Cohesion of a sq. in. in lb.	Authority.
Beech	·823	—	Chevandier
,, ...	·72	22,200	Bevan
,, ...	—	17,709	Muschenbroeck
,, ...	—	11,500	Barlow
Mahogany ...	—	8,000	,,
,, ...	·87	21,800	Bevan
,, ...	·80	16,500	,,
,, ...	1·063	—	Nystrom

—Carpenter.

[2600.]—**Cornish Churches.**—Will any of your readers please inform me of any published work on the old churches of Cornwall?—J. W. S.

[2601.]—**Church of S. James the Less, Westminster.**—Has there been published any illustration of the exterior of Mr. Street's church, S. James the Less, Westminster?—J. W. S.

[2602.]—**Polishing Alabaster.**—Would some marble mason kindly inform an apprentice how to polish alabaster?—Holland.

[2603.]—**Institute Prizes.**—I should be glad if some one who knows would inform me to whom belongs the right of disposing of the drawings for which prizes are awarded annually by the Royal Institute of British architects. Is there any condition which gives the Institute the right of retaining such drawings?—Aspiring Draughtsman.

REPLIES.

[2575.]—**Tool Chest.**—"An Amateur" will find the information he requires in the English Mechanic of June 7.—C. P. E.

[2594.]—**Moresque Style.**—"A Master Subscriber" will find what he wants, I think, in a book called "Illustrations of Architecture and Ornament," by J. B. Waring. If he cannot afford to buy this book he should study, and make drawings of, the Alhambra Court at the Crystal Palace.—C. P. E.

[2594.]—**Moresque Style.**—I beg to state that I have part of a work in my possession on the Moresque style of architecture. There are several fine decorative designs, interspersed with plans of the principal Moorish buildings. This work, which has no date, was written and described by a Mons. de Laborde, a French traveller, who visited Spain about the years 1795 to 1800, or perhaps later. The drawings are by M. Boudeville, painter to the king. Unfortunately, this French livraison, which I found amongst other old books of bygone days now lying in the attic, is incomplete; nevertheless the work, such as it is, is full to overflowing with engravings of capitals, friezes, Arabic and other inscriptions. I must not omit to say that there are also two beautiful vases, enriched with designs of a most complex character.—Amateur Artist.

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Longton Original Benefit Building Society.—The final statement of accounts of this society has just been issued. The society appears to have been satisfactorily managed. It was worked on the terminating principle, and the share roll at one time represented a subscribed capital of £67,700 in £100 shares, which, with the exception of the average number of withdrawn investment shares, has been realised to the entire satisfaction of every member. The amount subscribed for each £100 was £69 15s., and the profit on each share amounted to £30 5s.

Longton Independent Mutual Benefit Building Society.—The eighth annual report of this society, just issued, states that "the advances upon mortgages during the past year have amounted to £1,800. Although this sum is considerably larger than that of the two previous years, it falls very much below the average of the first six years, but there is every prospect of the advances during the next year being greatly increased. The deposits have been reduced during the year by £5,291 7s. 5d., leaving now in hand £12,976 6s. 4d. The net amount of mortgages held by the society is £83,580. The net profits of the year amount to £2,868 14s. 2d., increasing the gross sum to £16,728 10s. 2½d. The number of shares now in the society is 2,211¼, and the gross assets are £70,524 10s. 2½d., equal to £31 9s. 3d. per share." The annual meeting was held last Friday evening.

PARLIAMENTARY NOTES.

The Birmingham Sewerage Bill.—Mr. Mundella, on Monday, asked the President of the Local Government Board whether he was aware that in consequence of the rejection of the Birmingham Sewerage Bill by the House the promoters were individually liable for the expenses incurred in endeavouring to comply with two injunctions of the Court of Chancery; whether he was further aware that the property and revenues of the Corporation of Birmingham are liable to sequestration by the Court of Chancery for non-compliance with its injunctions, thus depriving a town of upwards of 350,000 inhabitants of all municipal government and control; and what steps the Government proposes taking to afford the relief necessary under such circumstances.—Mr. Stansfeld said he was afraid it must be admitted that in consequence of the rejection of the Bill by that House the promoters were now individually responsible for the expenses incurred. The Bill of the hon. member for York, the Borough Funds Bill, then waiting the consideration of the House, dealt with subjects of that character, and he knew of no other remedy than that which was provided there. The Government felt it to be important, under the circumstances, that the hon. member should have an opportunity of taking the opinion of the House on the question in the discussion of the clauses of that Bill; and they would facilitate that as far as possible.

Mr. Maclise's Frescoes.—Viscount Hardinge asked whether the attention of the First Commissioner of Works had been called to the condition of Mr. Maclise's frescoes in the Victoria Gallery, and whether any report had been made on the subject. The Duke of S. Albans said the subject had been referred to an eminent chemist, and a process would be adopted for the preservation of the pictures which had proved successful in other cases, namely, that of Mr. Wright.

Civil Service Estimates.—The House on Monday went into Committee of Supply on the Civil Service estimates. The sums necessary to complete the following votes were agreed to—£41,552, for Royal palaces; £101,376 for Royal parks; £132,875 for public buildings; £14,000 for furniture of public offices. On the vote of £30,241 for the Houses of Parliament, Mr. B. Osborne moved the reduction of the vote by the sum of £500 for a frescoe by Mr. Poynter, contending that all attempts to preserve the frescoes had proved utter failures.—Mr. Ayrton said that the only effect of the rejection of this item would be that some other decorations must be substituted.—A discussion ensued, in which a general opinion was expressed in favour of the mosaic work, specimens of which were to be seen in S. Stephen's Hall, and at last the item was ordered to be struck out.—The vote, as reduced, was then agreed to.—The following votes, after some discussion, were also agreed to:—£100,000 for the new Home and Colonial offices, £12,133 for Sheriff Court Houses (Scotland), £50,000 for the enlargement of the National Gallery, £20,000 for Glasgow University, £11,200 for the Edinburgh Museum, £172,000 for Post Office and Inland Revenue buildings, £47,000 for Burlington House, £127,210 for the Ordnance Survey, £35,130 for Harbours of Refuge, and £35,433 for rates on Government property.

Commons and Waste Lands.—Sir T. Sinclair, on Friday, asked the First Lord of the Treasury whether his attention had been directed to the report of the Inclosure Commissioners for this year, in which it was stated "that upwards of eight millions of acres of common and commonable land still remain unenclosed and waste, or about one-fifth of the soil of England, or equal to ten average counties; that at the rate of progress for the last twenty-five years it would take upwards of a century before one-third of this area is dealt with; that three millions of acres of this land is to be found in the lowland counties; that at least one million of these acres might be added to the productive area of agricultural land, being more than the Dutch have now won from the sea in three and a half centuries, and one-tenth of all the land under crop in England exclusive of grass;" and whether the Government would undertake to propose an immediate and effectual remedy for this state of things.—Mr. Gladstone—With reference to the particular passage quoted by my hon. friend, the Government have been aware that it is extremely desirable that there should be some legislation on the subject of enclosures, and that the useful application of labour as a means of increasing the supply of agricultural products should not be retarded for a lengthened period. At the same time, they are sensible of the difficulty of making progress at the present period of the session in this House, and therefore have thought it right that a Bill should be introduced in the other House. It has already been introduced there, and will shortly be in the hands of the members of this House, and it will be proceeded with as expeditiously as other arrangements will permit.

The Public Health Bill.—Mr. Rylands, on Thursday week, asked the President of the Local Government Board if it were the intention of the Government to proceed with the Public Health Bill this session; and, in that case, if it were proposed to withdraw any of the provisions contained in the Bill.—Mr. Stansfeld said it was unquestionably the intention of the Government to proceed with the Public Health Bill, and it was committed *pro formâ* on the previous evening for the insertion of some amendments and the withdrawal of certain clauses. He had, however, unwillingly come to the conclusion that, considering the advanced period of the session and the pressure of public business, it was necessary, in the interest of the Bill itself, to do what was sometimes called throwing part of the cargo overboard. He had examined the Bill in order to see what sacrifice it was necessary to make to ensure the passing of it. The House would remember that last year they consolidated certain departments of the Government in the Local Government Board. The Bill as it stood might be divided into three parts. The first part consisted of clauses organising the local sanitary authorities; then followed the body of the Bill, giving new powers to, and imposing new duties upon, those authorities; and then came a number of miscellaneous clauses giving greater facilities for the proceedings of the local authorities. It appeared to him that the best course this year was to limit legislation to the creation and consolidation of the local authorities; and to withdraw all the clauses relating to nuisances, hospitals, river pollutions, and other matters.

The Bermondsey and Rotherhithe Water Supply.—Mr. Kay-Shuttleworth asked the President of the Board of Trade what information he had obtained as to the dearth of water in a large district of London—Bermondsey and Rotherhithe—supplied by one of the Metropolitan Water Companies; and what steps were being taken by the Board of Trade and by the Water Company to avert the dangers to health which would result from a continued deficiency in the water supply.—Mr. C. Fortescue said he had received that morning the report of the inspector of the Board of Trade on that subject. It came to this. That the complaint of a deficiency of water at Bermondsey and Rotherhithe was well founded; that for several days the deficiency was of a serious character; that the real cause of that deficiency was a want of a sufficient head or store of water at the company's works, another cause which had contributed to the mischief being the defective fittings in the poorer houses of the district itself. The water company was taking the only step calculated to avert danger to the water supply in future by erecting at a large cost some important works, including a large reservoir at Nunhead. At the present time the supply of the district was very ample; but he was bound to add that what had occurred ought to induce the water company to hurry on the necessary improvements.

Tramways (Metropolis) Bills.—Mr. A Peel, on Wednesday, moved a series of resolutions to the effect that the promotors of any of the above Bills introduced in this or the last session now before Parliament shall have leave to suspend any further proceedings thereon in order to proceed with the same Bill, it they shall think fit, in the next session; but if they desire such suspension they shall give notice of their intention in the Private Bill Office not later than the 20th instant; that not later than three days after the next meeting of Parliament each suspended Bill may be deposited in the Private Bill Office in the form required by the standing orders, with a declaration signed by the agent annexed thereto, stating that the Bill is the same in every respect (except where any of the proposed works with which the promoters do not intend to proceed in the ensuing session have been omitted from the Bill) as the Bill with respect to which proceedings have been so suspended at the last stage of its proceeding in the House in the present session or in the session of 1871; and further that all petitions presented in the session of 1871 or in the present session against any such Bill, and which stood referred to the Committee on such Bill, shall stand referred to the Committee on the same Bill in the next session of Parliament.—The resolutions were agreed to after a brief discussion.

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Memorial to Nicholas Wood.—Newcastle-on-Tyne.—A magnificent edifice, erected to the memory of Nicholas Wood, at a cost of £20,000, by the coal trade and mechanical engineers of the North of England, was inaugurated on Tuesday. The building is very elaborate and magnificently furnished. A life-size marble statue of Nicholas Wood was unveiled.

The Bermondsey Water Supply.—The energetic measures adopted by the Committee of Ratepayers in Bermondsey have at length resulted in a great improvement in the supply of water to the neighbourhood. It was stated on Monday night, at a meeting of the Committee, held at the Finish, in Linton-road, that the Southwark and Vauxhall Waterworks Company had been induced to use extra exertions to maintain the supply, and now here was no complaint of a "water famine," though in one or two isolated cases things were as bad as ever, showing that there was still room for improvement. The company, however, are actively pushing on their new works at Nunhead, which they hope to complete in ten months, when all fear of another dearth will be removed.

Our Office Table.

The Society for the Encouragement of the Fine Arts.—On Thursday week last a numerously and fashionably attended *soirée* of the above Society was held at the Gallery of the Society of British Artists. The Chairman of Council (Captain Britten), Mr. Henry Tidey (Vice-President), and several other members of the Council, with the honorary secretary (Mr. George Browning), received the guests on their arrival. The completeness of the arrangements, the pleasant selection of vocal and instrumental music, and the interesting collection of pictures, added much to the enjoyment of the evening. Admiral Sir Edward Belcher, K.C.B., Sir Walter Stirling, Bart., Major Robertson; Captains Betly, Wood, Oldfield, and Petrie; and Chief Buhkwujjaene (of Canada, in native costume) were among those present. This, the fourth, *conversazoine*, concludes the fourteenth session of the society.

A Novelty in the Building Trade.—An Exeter correspondent of the *Pall Mall Gazette* writes:—"A twenty-roomed house, complete with grates, stoves, and fittings, has just been brought by ship to Exmouth, for transmission by rail to North Tawton (North Devon). The house was built in Norway for a gentleman at North Tawton named Vicary. It is mostly built of wood, and, it is said, can easily be taken to pieces and put up again in any locality desired. The house will be unshipped at Exmouth, and conveyed over the London and South Western line to its destination. Great interest is being taken in this novel cargo alike by employers and employed in the building trade. Until, however, the house is put up and inhabited any opinion upon the stability or suitability of the structure must be withheld. It should be stated that men have been brought from Norway to put it up, so that the owner will be altogether independent of home labour."

"Flint Jack" Again.—The notorious forger of antiquities (who gives the name of Edward Simpson, of Whitby) has, it appears, been very active of late. He has turned up at Stamford, where it is stated he has been busy manufacturing rings, monastic seals, and flint arrow heads. Mr. A. C. Elliott, of Stamford, has had the man photographed, and intends to circulate copies, that the young collectors may recognise the fabricator on his first visit.

Mr. Andrew MacCallum's pictures from Egypt, painted during his recent tour in that part of the world, have been arranged and privately exhibited at Campden-hill. They are about twenty in uumber, and the wealth of colour for which his paintings are well-known is seen to great advantage in the graphic and life-like representations of monuments and scenes in the desert, on the Nile at Karnak, Thebes and Cairo, and Alexandria. It seems odd that Egypt should have lain so long neglected by artists in quest of novel studies and picturesque details. The tombs of the Pharaohs, the gigantic figure of Rameses, overturned in the desert, the vast temples and palaces of Karnak, the Memnonic sculptures, the great Pyramids, surrounded at the base by a misty cloud of light sand, so fine as to be nearly impalpable, and the miles of monumental sculptures in the vicinity of Thebes, afford abundant opportunity for careful drawing as well as for gorgeous colouring; and now that the example is set by an artist of Mr. MacCallum's rank, it may be pursued with profit by not a few among our more ambitious travelled painters.

Abolition of London Tolls.—On Monday last the remaining toll-gates on the northern side of London were at length swept away, and this reform, which was begun some eight years ago, was thus completed. It can now hardly be credited, as a contemporary remarks, that only ten years since turnpike-gates with permanent toll-houses and collectors actually existed within three-quarters of a mile of the Bank of England; or that some few years earlier, white-aproned officials were stationed at Moorgate with power to arrest any vehicle not belonging to a freeman of the City, and compel the driver to pay tribute before allowing him to pass that imaginary barrier. Now a vehicle or horseman will be enabled to go in any direction some ten or fifteen miles out of London without any chance of encountering this nuisance, and it is to be hoped that few years will elapse before this reform is extended throughout the United Kingdom.

The Institute Conversazione.—In our note last week on the *conversazione* at the Royal Institute of British Architects, we omitted to notice among the art objects exhibited an interesting series of water-colour sketches of public buildings in Paris by Mr. R. P. Spiers, and the very valuable collection of ancient British pottery, which the exhibitor, Mr. John S. Phené, F.S.A., had exhumed from cist-vaens on the estates of the Marquis of Lothian and other noblemen. One of the urns, the property of the Lord Lothian, is almost unmatched in size, being more than 17in. in diameter; several elegant and fragile urns of a small size were also in the collection.

All Saints' College, Oxford, and its Architect.—All Saints' College, Oxford, has (says the *Spectator*) done a shabby thing. After employing a Roman Catholic architect, Mr. Clutton (a convert of some eighteen years back)—no doubt without full knowledge, on the part either of the College or of its Managing Committee, of the religion of the architect—to advise them on needful repairs to the structure of their fine old chapel, and having been told by him of the probable existence of the remains of the once-celebrated reredos of Chichele, behind Thornhill's picture of the Assumption of Chichele, the College has suddenly taken the restoration of the old chapel out of his hands, after the remains of the beautiful reredos had been found in perfect correspondence with his prediction, on the ground that "there is a strong and general feeling against placing such a work as the restoration of the newly-discovered reredos in the hands of any architect whose views are not formed on the same theological basis as that of the members of the College." Mr. Clutton seems to think that this act is a reflection on his professional character as an architect, which is absurd, since it is honestly avowed to be only a reflection on his religious character as a Roman Catholic. It is very hard upon an artist to see other men entering into the fruits of such labours as Mr. Clutton's; and for our own part, we think that if All Saints' dreads Roman Catholic architecture, it would have been wiser not to uncover the reredos at all, but to leave it buried in its architectural grave.

Art Collection on Loan.—The third annual loan exhibition of porcelain in connection with the Salisbury and South Wilts Museum has just been thrown open to the public. Last year the authorities limited their attention to the production of Sèvres. The collection for the present year, which comprises about 200 pieces, is composed entirely of statuettes and representations of animal life. The British portion contains examples, some of which are choice and interesting, of Bow, Chelsea, Derby, Plymouth, and Rockingham, the only factories to which works of this character can with certainty be attributed; while the ceramic art of the Continent is represented by specimens of almost every European establishment of note. A few of the objects have already been shown at the South Kensington Museum, Manchester, and elsewhere, while others are figured in Mr. Chaffers's recent work, "The Keramic Gallery." The collection will remain open gratuitously until the last week in September, when it will be broken up, and its contents returned to their respective owners.

Messrs. Morant, Boyd, & Blanford, Decorators, New Bond-street.—The *employés* of the above firm had their annual bean-feast on Saturday last in the beautiful grounds at Broxbourne, where the majority of the men arrived by train at an early hour to carry out a series of preconcerted races and athletic sports, which comprised the following:—Race 1, at 10.40, 100 yards handicap, for two prizes—an enriched tea-pot, and a set of knives and plated forks, presented by the firm—contested in four heats, the two first in each heat to contest in a final heat. Result: Ansen, accountant, 1; Davis, artist, 2.—Race 2, at 11.10, veterans over forty years, 100 yards' handicap, in two heats, the two first to contend in a final heat. Result: Balant, cabinet-maker, 1; Mills, carpenter, 2. Two prizes —a tea-pot and water jug.—Race 3, at 11.25, hurdles, 200 yards level, for two prizes—a breakfast cruet and salt cellar—two heats, the two first to contend in a final heat. Result: Isley, cabinet-maker, 1; Burton, cabinet-maker, 2.—Race 4, at 12.15, the high jump—one prize, a cream jug. Result: G. Mathews, upholsterer (4ft. 3in.), 1; Isley, cabinet maker, and penalised 4in. as a previous winner of a prize (4ft. 6in.), 2.—Race 5, at 12.35, the long jump—one prize, a plated toast rack. Result: Perkins, cabinet-maker (13ft. 2in.), 1; Burton, cabinet maker, penalised 6in. (13ft. 6in.), 2.—Race 6, at 12.55, half-mile handicap, handicapped by P. Boyd and T. Blanford, Esqrs.—three prizes, a butter cooler, cruet stand, and salt cellar. Result: Wells, upholsterer, 1; Davis, artist, penalised ten yards, 2; and Silver, assistant, 3.—Race 7, 1.10, consolation race, 300 yards, level—two prizes, tea-pot and salt cellar. Result: G. Hutchins, carpenter, 1; W. Carpenter, carver, 2. Thus terminated a series of well-contested races, which reflected great credit on all engaged. The following gentlemen officiated:—Starter, Mr. Frost; judge, Mr. Carpenter; acting committee, Messrs. Anson, W. Carpenter, and G. Hutchins. Upon the termination of the races the company adjourned to the crystal saloon, where covers were laid for eighty persons. Mr. Herbert, treasurer, having been voted into the chair, in the absence of R. Morant, Esq., through illness, and the customary formalities observed, the covers were removed, and ample justice done to what was anything but a satisfactory serve up, and we think, for the price paid, 8s. 6d. per head, a complete serve-out. The same result awaited the pastry, which although not wanting in quality was certainly wanting in quantity. The cloth having been removed, the chairman read two letters, one from R. Morant, Esq., who regretted being absent through indisposition, but wishing all every enjoyment on the occasion, which was enthusiastically acknowledged and a suitable reply recorded; the other from T. Blanford, Esq., who regretted also not being able to be be present, on account of extra demands upon his time. The chairman then proceeded to award the prizes to their respective claimants, and, after the usual loyal, patriotic, and personal healths had been duly acknowledged, the chairman vacated his seat, and the company retired to enjoy the beautiful grounds and to amuse themselves with games, the requisites of which are abundant in the ground.

The Palace of Westminster.—The annual discussion of the Civil Service Estimates affords members of the House of Commons their only direct opportunity of criticising the arrangements made for the preservation and decoration of the building in which their deliberations are conducted. The Palace of Westminster is an unfortunate building. Its destiny seems to be that it shall be rebuilt by pieces, and redecorated much in the same fashion. All kinds of strengthening medicines have been administered to its outer structure in the way of indurating solutions which do not indurate, and compositions which only seem to decompose. The only efficient remedy appears to be cutting away the diseased stones, and replacing them by sound ones, and the next generation will possibly be able to discuss the success or failure of this somewhat costly method of rebuilding. Meanwhile, the interior of the building considerately adapts itself to the general condition of things. The frescoes, for the last of which Mr. Maclise was paid £7,500 each, are rotting to pieces, and the mosaic decoration which it is proposed in future to employ is by no means satisfactory from an art point of view. The difficulty is a real one, and even Mr. Ayrton, accustomed as he is to deal with all that appertains to architecture satisfactorilyto himself, if not to every one else, seems somewhat embarrassed by the present aspect of affairs, and a trifle bewildered by the conflicting opinions of the art-loving members of the House of Commons as represented by such gentlemen as Mr. Beresford Hope and Mr. Bernal Osborne. Possibly, after all, the Houses of Parliament may last long enough to furnish a subject for the eloquence of the first-named senator and the irreverent and rather strained wit of the other, and in that case nobody but the public has any right to grumble. When the new Law Courts are erected, and S. Paul's Cathedral restored, architects ,moreover, will doubtless be provided with fresh topics of contention, and opportunities for abusing each other, so we may then afford to witness with composure the disappearance of the Palace of Westminster into the Thames—a fate we once remember hearing charitably hoped for it by one of its least enthusiastic admirers.

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CHIPS.

A meeting of the creditors of Harry Barr, of Great College-street, Camden Town, is called at the offices of Dalton & Jessett, S. Clement's House, for the 18th inst., at 2 o'clock.

The foundation stone of a new Congregational Chapel was laid at Dedham on Wednesday week. Messrs. Sulman & Rhodes, of Guildhall Chambers, are the architects, and Messrs. Saunders & Son, of Dedham, builders.

On Tuesday next a lecture will be delivered before the Christian Evidence Society by Mr. W. R. Cooper, on the corroborative evidence of Old Testament history from the Egyptian and Assryian monuments.

A marquee has been erected by the London Swimming Club, on the south side of the Serpentine, for the use of bathers. Any gentlemen can obtain the right of using the marquee during bathing hours on application to the secretary.

A new (Roman) Catholic Church, dedicated to our Lady of the Sacred Heart, was opened on Sunday week, at Cleator, Cumberland. The cost has been about £5,000. Mr. E. Welby Pugin is the architect.

According to the *City Press*, 120,000 square feet of land on the Holborn Viaduct have been let upon a building lease for £15,000 per annum.

A missional chapel was opened at Kettleness, near Whitby, on the Feast of S. John the Baptist. The style is Gothic, and the building will seat 137 persons, at a cost of £300. Mr. Charles Noel Armfield is the architect.

S. Andrews Church, Whittlesey, was reopened on Tuesday week, after restoration by Mr. R. R. Rowe, of Cambridge.

New Wesleyan Schools have been opened at Stafford. Mr. T. Roberts, of Trentham, is the architect, and Mr. A. F. Whittome, of Stafford, the builder; the cost is £1,200.

. The foundation stone of the new Vestry Hall for Camberwell, of which Mr. E. Power, of Walbrook, is the architect, is expected to be laid about the first week in August.

Her Majesty has intimated her intention of conferring the honour of knighthood on Mr. Geo. Gilbert Scott, on the occasion of the completion of the Prince Consort's National Memorial in Hyde Park.

At the late election of annuitants to the Provident Clerks' Benevolent Fund, when ten new annuitants were placed on the Fund, the following donations were announced, viz., Merchant Taylors' Company, 30 guineas; Lloyd's Register, 100 guineas.

The new low-water pier at Douglas harbour was opened on Monday. The pier is 500ft. in length, 52ft. in height, and 50ft. in width, with 10ft. of footway on each side. It has been built from plans prepared by Sir John Coode, at a cost of £46,000.

On Wednesday the memorial stone of a new Wesleyan Chapel was laid at Chester. The style is Gothic, and the building will seat 800 people, at a cost of £5,000. Mr. W. Botterill, of Hull, is the architect.

Trade News.

WAGES MOVEMENT.

Blackburn.—The joiners of Blackburn having applied for an increase of wages, the masters and men held a conference last week, at which it was arranged to form a board of arbitration to which all matters should be referred, Mr. W. A. Hulton, County Court Judge, to be asked to act as umpire.

Glasgow.—A correspondence has taken place between the quarry masters of Glasgow and the master masons on the subject of the present strike in the mason trade. The chairman of the quarry masters first wrote, suggesting that each party should hold a special meeting and reconsider their present relative positions, and if possible make mutual concessions and effect a settlement, adding, "We would submit for your consideration that the following question be put—viz., are you, the operative masons, willing to resume labour provided the employers agree to pay 7d. per hour to fair workmen, and to each mason who desires it the sum of 15s., provided he has that amount wrought for, on the Saturday in the middle of the pay, to be deducted on pay day?" The secretary of the Master Masons' Association, in reply, pointed out "that the masters at the commencement of the strike had conceded the most important part of the operatives' demands—viz., an advance of one halfpenny per hour—and therefore did not expect that the operatives would have pressed the other part of their demands to a strike, bringing great loss to all concerned; and since you have already acted the part of mediators in this matter, we are still ready to show our willingness to have the matter settled by agreeing to your proposals, as contained in your letter of submission to the operatives of 21st June, 1872."

London.—The strike still continues, and matters are on much the same footing as last week, except that the feeling between the men and the masters is more embittered. On Friday last, at a meeting of the Executive Committee on Labour and Capital, appointed by the Social Science Association, it was resolved:—"That the Committee greatly regret that the measures which were in progress for bringing the present dispute between the master builders in London and their workmen to a friendly termination, by a meeting of representatives of both classes, and, if necessary, by a reference to arbitrators, have for the present failed, and that the result is the continuation of a strike on the part of some of the workmen, and the resort to a lock-out by some of the masters. That as both parties to the present dispute have expressed their approval of the principle of arbitration, although neither party has succeeded in submitting a definite proposal which the other has thought it desirable to accept, the Committee venture to hope that, occupying as they do a perfectly neutral position, a suggestion on their part, with a view to arbitration may meet with favourable consideration. That the Committee, therefore, respectfully suggest that a court of arbitration should be at once constituted, consisting of an equal number of the representatives of employers and employed, who shall, at their first meeting, elect an umpire or referee, and that all matters in dispute shall be referred to such court, whose decision shall be final, it being agreed that, pending such award, both parties may maintain their present position." This resolution was signed by Messrs. A. J. Mundella, R. Torrens, W. Cowper-Temple, Thomas Hughes, Samuel Morley, W. Morrison, Auberon Herbert, George Dixon, Thomas Brassey. On Saturday this proposal was considered and rejected by the masons. At a meeting of the carpenters and joiners, it was resolved to invite the other trades on strike and locked out to form a joint committee with a joint purse to conduct the strike. A meeting was accordingly held on Monday, at which the following resolution was ultimately adopted:—"That in the opinion of this meeting, composed of delegates from the carpenters, masons, plasterers, painters, smiths and metal workers, and labourers, it is desirable to form a central committee of delegates of all trades affected by the lock-out for the purpose of collecting subscriptions from the general trades, such subscriptions to be divided equally among each trade in proportion to the number of men locked out, but each trade to have power to collect and appropriate the levies and subscriptions from its own members, and internally manage its own affairs." It was then resolved that the above resolution should be placed before each trade for confirmation, and the meeting stood adjourned until Monday next. At the masons' meeting on Monday, the chairman, Mr. Broadhurst, said a large party of the locked-out men had left London that morning for Bradford to work on a job at that place; another party had left for Westmoreland, where a large job was being executed by a London firm. In addition to this several of the men had obtained work in London at the open shops. The number of locked-out men had thus been materially reduced. On Tuesday the carpenters also rejected the Social Science Committee's scheme of arbitration. The Central Association of Master Builders issued the following statement:—"At a meeting of the Committee of the Central Association of Master Builders, held yesterday, a communication was received from the Executive Committee on Labour and Capital, appointed by the Social Science Association, suggesting that a court of arbitration should be at once constituted, consisting of an equal number of the representatives of employers and employed, who shall at their first meeting elect an umpire or referee, and that all matters in dispute shall be referred to such court, whose decision shall be final, it being agreed that pending such award both parties may maintain their present position, The communication was signed by nine members of Parliament, including Messrs. Mundella, Cowper-Temple, T. Hughes, Auberon Herbert, and others. After considerable discussion, the Committee of the Central Association passed the following resolution, and forwarded it at once to Mr. Pears, the Secretary of the Social Science Association:—'The Committee of the Central Association of Master Builders are willing to adopt the suggestion made by the Committee on Labour and Capital appointed by the Social Science Association, and are quite ready to refer the pending questions to a tribunal constituted as proposed and to abide by its decision.' Up to this day the communication referred to in some of the newspapers as having emanated from the Trades Council, had not been received by the Central Association of Master Builders. From the returns made to the Committee of the Builders' Association it appears that up to the present time 85 firms have locked out, 21 more have partly locked out, and 55 more are under engagements to reduce the men in their employ to the lowest possible number. The firms referred to above comprise, with one or two exceptions, all those of any importance who supported the lock-out in 1859, and the great majority of those who have risen to any position since that time. The number of men locked out does not equal the number of men locked out in 1859, but is certainly more than double the largest estimate put before the public by the workmen. Upwards of 13,000 men are now either on strike or locked out, and a great portion of the difference between this number and the number in 1859 is accounted for by the continued depression in the building trade of London, which has been the main argument of the masters in resisting the demands of the men. Communications have been received by the Masters' Association of meetings which have been called in the principal towns in the provinces for co-operating with the masters of London, at which measures will be taken for reducing the number of hands now contributing towards the strike. The rumours of want of faith on the part of some of the London masters in carrying out the lock-out, have been investigated by the Committee of the Central Association, and have been found in almost all cases to be either grossly exaggerated or wholly untrue." On Wednesday, at the mason's meeting, Mr. Broadhurst was particularly severe upon Mr. Mault, the editor of the *Builders' Circular*, and secretary to the General Builders' Association, for throwing out the following hint in his circular letter of the 28th ult., inviting provincial master builders to come to the assistance of their London brethren—viz.: "At the same time, if it be possible, it would be very desirable that some arrangements should be made for the simultaneous discharge of all hands—especially carpenters, joiners, and masons—that could be spared, say on the next pay day after the meeting; and let it be understood what is meant by it." He said he had never heard of a more glaring interference with the liberties of the people than that. Were half such things done by the workmen, the Criminal Law Amendment Act would be brought down upon them immediately; but it was hopeless attempting to enforce the law against capitalists, because it was easy to find a loop-hole of escape in the penal measure of a class Parliament. These letters were a clear violation of the combination and intimidation clauses; but, supposing they were to try and enforce the law, there would be no chance of being heard, let alone obtaining a conviction. He, however, did not attach any great importance to these circulars; they had seen them used in days gone by, and they knew the results they produced. Not 200 masters could be got to pull together, and 80 per cent. of the employers would treat such communications in the same contemptuous manner as the one at Aylesbury. Nevertheless, it would be every man's duty to do his best to get rid of the abominable Criminal Law Amendment Act, and at the next general election no candidate should be supported by working men who would not pledge himself to vote for its repeal. Mr. Broadhurst, accompanied by Messrs. Sinclare and Matkin, of the Carpenters' Central Committee, proceeded to Birmingham yesterday to attend the demonstration made there last night in support of the men on strike and locked out.

TENDERS.

Ashford.—For making roads at the West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—

Jones	£887	14	6
Brooks	882	0	0
Hetton	756	0	0
Kirk	717	0	0
King	700	0	0
Batch	694	19	0
Cole	613	0	0
Nicholson	575	0	0

Blackheath.—For erecting four houses in The Grove, Blackheath, for the Right Hon. the Earl of Ashburnham. Mr. Herbert Williams, architect. Quantities supplied by Mr. Charles Reilly:—

Newman & Mann	£9286
Manley & Rogers	8637
Foster	8576
Adamson & Sons	8489
Turner & Sons	8196
Merritt & Ashby	8047
Jerrard	7993

Bridlington Quay.—For the erection of a Wesleyan Chapel, Bridlington Quay. Mr. W. Botterill, Hull, architect:—

Rennard (accepted)	£4046	6	0

N.B.—The old materials now upon the site to be again used, subject to the architect's approval.

Cambs.—For erecting a residence and four cottages at New Wimpole, Cambs, for Messrs. P. & A. H. Meyer. Mr. Edward Nash, Royston, architect. Quantities not supplied:—

Thoday	£2772
Bunting	2315

Hessle.—For stabling, coach-house, and buildings, for Mr. James Hodgson, Belmont, Hessle. Mr. W. Botterill, Hull, architect. Quantities not supplied:—

Kelsey	£1625	0	0
Stephens	1610	0	0
Habbershaw	1581	15	0
Clarkson	1552	0	0
Lison & Wilkinson	1544	0	0
Drewery	1539	0	0
Suddaby	1510	0	0
Stanley (accepted)	1478	0	0

London.—For the extension of the Stock Exchange Mr. J. J. Cole, architect. Quantities supplied by Mr. Bennett:—

Higgs	£14141
Manley & Rogers	13455
Henshaw & Co	13275
Ashby & Sons	13150
Dove Brothers	12885
Hill & Sons	12790
Perry & Co. (accepted)	11600

Narborough.—For the erection of a detached villa residence at Narborough, near Leicester, for John Bevan, Esq. Messrs. Willoughby & Son, architects:—

Glover & Son	£1251	8	0
Osborne Brothers	1230	0	0
Mason	1200	0	0
Kellett	1200	0	0
Sackree	1200	0	0
T. & H. Herbert	1190	0	0
Major	1150	0	0
Smith & Mowbray	1125	0	0
Lewitt (accepted)	1100	0	0
Foister	1050	0	0
Brown	1029	0	0

Ramsgate.—For the erection of six residences at Ramsgate, Kent, for N. B. Kennard, Esq. Mr. Charles Baily, architect, Newark. Quantities supplied by Mr. Poland:—

Wigmore	£8003	10	0
Barwick	7797	17	0
Wilson	7417	18	0
Osborne	6622	0	0
Hayward	5838	0	0
Smith & Sons (accepted)	5250	0	0
Harrison	4915	0	0

Suffolk.—For the erection of a manufactory and cottages at Haverhill, Suffolk:—

Thoday	£2234	15	0
Bell & Son	2340	0	0
Mason	2453	0	0
Hall	2249	10	0
Mason & Fell	2070	0	0
Brown	2660	0	0
Shurmur	2540	0	0

Tunbridge.—For Tunbridge sewerage works. Mr. C. Jones, engineer:—

Crockett	£10244	4	9
Ritson	9658	11	1
Cole	9429	6	0
Marshall	9320	0	0
Neave	8998	8	8
Punnett & Sons	8781	3	0
Blakemore & Howard	7211	0	0

Wandsworth.—For additional aisle, transept, and porch to Holy Trinity Church, Wandsworth. Mr. J. M. K. Hahn, architect. Aviss & Co.'s tender accepted.

West Moulsey (Surrey).—For the construction of 420ft. of 30in. ring sewer, and sediment-tank, at The Grange, for Mr. Alexander J. R. Stewart. Messrs. Bateman & Mather, surveyors:—

Hibbins & Traslor	£174
Conder & Sons	171
Jarvis (accepted)	162
Sease	100

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COMPETITIONS OPEN.

BATLEY, August 15.—For plans for setting out a close of land adjoining the Public Hall. Premiums of £25 for the best, and £10 for the second best designs.—Mr. Thomas Dean, Town Clerk, Batley.

BELFAST, July 25.—For plans for laying out the surplus grounds for building purposes, and the Public Park at Ormean. £100 will be given for the adopted plan.—Mr. J. Guthrie, Town Clerk, Town Hall, Belfast.

BLACKPOOL, July 15.—For plans and elevations for the erection of a new market-house. Premiums of £30 for 1st, £20 for 2nd, and £10 for 3rd designs.—Mr. R. Gorst, Surveyor, Blackpool.

HAVERFORDWEST, July 31.—For plans and specifications for the alteration, enlargement, and improvement of the Tabernacle Congregational Chapel.—Mr. S. Thomas, Draper, Haverfordwest.

S. PETERSBURG, July 13.—For a design for a permanent bridge over the River Neva, at the place now occupied by the Litenaia floating bridge. A prize of 6,000 silver roubles (about £825) will be given for the design the committee consider as best fulfilling the conditions; also a prize of 3,000 silver roubles (about £412 10s.) and 1,500 silver roubles (about £206 5s.) for the two next best designs.—Municipal Council, S. Petersburg.

SCARBOROUGH SCHOOL BOARD, August 1.—For designs for a school for eight hundred children.—Mr. G. Dippie, Clerk to the Board, Town Hall, Scarborough.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

ADMIRALTY (Whitehall), July 26.—For the supply of white-lead paint to Portsmouth Dockyard.—Mr. F. W. Rowsell, Superintendent of Contracts.

BRADFORD SCHOOL BOARD, July 8.—For the erection of a school in Bowling Back-lane.—Messrs. Milnes & France, Architects, Bradford.

BROSELEY GAS COMPANY, July 17.—For the iron apparatus, cast-iron pipes, &c., for their works.—Mr. T. Abercrombie Hedley, Engineer, Wolverhampton.

ELY UNION, July 11.—For the erection of detached infectious wards at the workhouse.—Mr. D. Oldfield, Architect, 7, Westminster-chambers, Victoria-street, S.W.

HOVE (near Brighton), July 8.—For drainage works on the Vallance Estate.—Mr. Thomas Lainson, 170, North-street, Brighton.

INDIA OFFICE, July 8.—For the supply of 60 water columns.—Mr. G. C. Talbot, Director General of Stores.

LANCASHIRE AND YORKSHIRE RAILWAY, July 16.—For the construction of a branch railway, about 3 miles 38 chains in length.—Mr. W. S. Lawn, Secretary, Hunt's Bank, Manchester.

LEWISHAM (Kent), July 29.—For taking down and rebuilding the County Bridge.—Mr. M. Bulmer, County Surveyor, Maidstone.

LONDON, July 13.—For the purchase of the whole of the pewing, seating, and gas fittings of the Poultry Chapel.—Secretary, London Joint Stock Bank.

LYMINGTON, July 8.—For the erection of a coast-guard station, consisting of an officer's house, six cottages, watch and store-house, &c.—Director of Works Department, Admiralty, Spring-gardens, S.W.

MARKET DRAYTON, September 30.—For repairing the highways.—Mr. George Gordon Warren, Clerk to the Highway Board, Cheshire-street, Market Drayton.

METROPOLITAN BOARD OF WORKS, July 11.—For the erection of an oak park fence to enclose Finsbury Park along the Seven Sisters' road.—Mr. G. Vulliamy, Architect to the Board, Spring-gardens.

METROPOLITAN BOARD OF WORKS (Plumstead District), July 24.—For the construction of 813ft. run of 36in. × 24in. brick sewer, 2,992ft. run of 36in. × 24in. half brick sewer, and 550ft. run of 12in. pipe sewer.—Mr. J. M. Dale, Clerk to the Board, Old Charlton, S.E.

NORTHWICH, July 15.—For the erection of the first portion of the Market Hall.—Mr. H. J. Bennett, Surveyor, Local Board Office, Northwich.

READING, July 9.—For the construction of the foundation for sewage pumping station buildings, and for timber and ironwork in a bridge and sluices over the River Kennet.—Mr. T. Rogers, Clerk to the Board, The Forbury, Reading.

S. AUSTELL, July 12.—For the erection of the Central Schools for boys, girls, and infants, with offices, class-rooms, board-room, and separate tenders for master's residence attached to same.—Mr. Silvanus Trevail, A.A., Architect, Par Station.

SWANSEA, July 8.—For the supply of gas for ten years.—Mr. R. A. Essery, Town Clerk, Guildhall, Swansea.

TYNEMOUTH SCHOOL BOARD, July 10.—For the erection of the Western Schools.—Mr. T. Younger, Clerk to the Board, Howard-street, North Shields.

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Shot, Patent	do	23 0 0	0 0 0
Red or minium	do	23 5 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry	do	27 10 0	0 0 0
,, ground in oil	do	0 0 0	0 0 0
COPPER.			
British—Cake & Ingot	per ton	£110 0 0	£116 0 0
Best Selected	do	113 0 0	118 0 0
Sheet	do	115 0 0	121 0 0
Bottoms	do	117 0 0	123 0 0
Australian	do	108 0 0	114 0 0
Spanish Cake	do	100 0 0	0 0 0
Chili Bars, cash	do	104 0 0	105 10 0
,, Refined ingot	do	106 0 0	113 0 0
Yellow Metal	per lb.	0 0 9¼	0 0 10¼
IRON.			
Pig in Scotland, cash	per ton	£5 13 9	£0 0 0
Welsh Bar, in London	do	11 10 0	12 0 0
,, Wales	do	10 15 0	11 0 0
Staffordshire	do	12 10 0	13 10 0
Rail, in Wales	do	10 10 0	11 0 0
Sheets, single in London	do	19 0 0	20 0 0
Hoops, first quality	do	16 0 0	17 0 0
Nail Rod	do	14 10 0	0 0 0
Swedish	do	15 0 0	15 10 0
OILS, &c.			
Seal, pale	per tun	£43 10 0	£0 0 0
Sperm body	,,	90 0 0	92 0 0
Cod	,,	35 0 0	0 0 0
Whale, South Sea, pale	,,	39 0 0	40 0 0
Olive, Gallipoli	,,	47 0 0	0 0 0
Cocoanut, Cochin, tun	,,	38 0 0	38 10 0
Palm, fine	,,	37 0 0	37 0 0
Linseed	,,	34 15 0	35 0 0
Rapeseed, Eng. pale	,,	39 10 0	40 0 0
Cottonseed	,,	32 0 0	0 0 0
TIMBER.			
Teak	load	£14 0 0	£15 0 0
Quebec, red pine	,,	3 15 0	5 0 0
,, yellow pine	,,	3 15 0	6 0 0
Quebec oak, white	,,	6 0 0	6 5 0
,, birch	,,	3 15 0	5 0 0
,, elm	,,	4 15 0	5 0 0
Dantzic oak	,,	3 15 0	6 0 0
,, fir	,,	2 10 0	5 0 0
Memel fir	,,	3 5 0	4 0 0
Riga	,,	3 10 0	3 15 0
Swedish	,,	2 5 0	2 10 0
Masts, Quebec red pine	,,	4 0 0	6 10 0
,, yellow pine	,,	4 0 0	6 10 0
Oregon	,,	7 0 0	9 0 0
Lathwood, Dantzic, fm.	,,	5 0 0	7 0 0
,, St. Petersburg	,,	9 0 0	10 0 0
Deals, per C., 12ft. by 3 by 9in.,			
Quebec, white spruce	,,	18 0 0	19 0 0
St. John, white spruce	,,	13 0 0	14 0 0
Yellow pine, pr reduced C			
Canada, 1st quality	,,	20 0 0	22 0 0
,, 2nd do	,,	14 0 0	15 0 0
Archangel, yellow	,,	12 10 0	14 10 0
St. Petersburg, yellow	,,	12 0 0	13 5 0
Finland	,,	7 10 0	8 10 0
Memel and Dantzic	,,	0 0 0	0 0 0
Gothenburg, yellow	,,	8 10 0	11 0 0
,, white	,,	8 0 0	9 0 0
Gefle, yellow	,,	10 10 0	12 10 0
Soderham	,,	8 10 0	12 0 0
Christiania, per C., 12ft. by 3 by 9in., yellow	,,	10 0 0	12 10 0
Other Norway	,,	8 0 0	9 0 0
Flooring boards, pr square of 1in., first yellow	,,	0 10 0	0 11 6
First white	,,	0 9 0	0 10 0
Second qualities	,,	0 6 0	0 9 0

BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

Thomas Simmons, Sheffield, ironfounder, July 18, at Sheffield.—Joseph Harrison, Waterloo, near Ashton-under-Lyne, brickmaker, July 12, at Ashton-under-Lyne.—William Hesketh, Liverpool, collector of rents and builder, July 10, at Liverpool.—George Beard, Hartpury, brickmaker, July 19, at Gloucester.

SITTING FOR PUBLIC EXAMINATION.

July 31, R. Parry, Landore, builder.

DIVIDEND MEETING.

July 17, T. Richards, Milford Haven, brass and ironfounder.

DECLARATIONS OF DIVIDENDS.

J. Cowell, Liverpool, builder, div. 3s.—R. Wrigley, Oldham, builder, div. 3s. 10d.

PARTNERSHIPS DISSOLVED.

Horn & Smith, Farleigh-road, Stoke Newington, builders.—J. Baker & Co., Albert-hill Saw Mills, Darlington.—White & Morgan, Manchester, joiners.—E. J. & E. J. Cain, Upper Grange-road, Bermondsey, timber merchants.

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THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 380, published July 5, 1872, contains Articles on:—Electro-Metallurgy.—II.; Lessons on Chemistry; Our Food Supply and the Sewage Question; Instinct; The Holtz Electrical Machine; Improvements in Glass-Making; The Cultivation of Grapes Under Glass; Self-Acting Reducing Valve; Preserving Photographic Prints; Woods Used in Shipbuilding: Their Characteristics and Special Applications; Mechanism; Ebdy's Patent Gas-Stove; The Turners and Turnery of King's Cliffe, Northamptonshire; Royal Society; Chemical Society: Useful and Scientific Notes; A Giant Planet; Axes of the Planets; Gassendi; Milk; Aristarchus and Herodotus; Sun Spots; Novel Method of Sawing Timber; Wire-Covering Machines.—II.; The Negro; Stone Coal; Meteor; Brannan's System of Monolithic Building; Monolithic Building; The Harp; Fiddles; Amateur Organ Building; Wood Pulp for Paper-making; Condensation of Steam in Pipes; Draining Mines of Water; Turret Clock Line; Water Bellows; Sewing Machines; The Phenomenon of Argostoli; The Ancient Constellations; Plato.—Jupiter; Comparing Electro-Motive Forces; Our Coal Stores and the Atmosphere; Balsamed Object-Glasses; The Piano-Violin; Microscope Castings—Mounting Small Objects in Balsam; Microscope Castings; Entomological—V.—On Imagos; Finding Internal Resistance of a Battery; Radius of Surface of Object-Glass; Recurrent Vision—Electricity; A Tool for Punching the Rivets out of Broken Watch-Chains; Performance of Telescope; Spinning Tops and Gyroscopes; Spinning Top—Upward Deflection of Bullet; Co-Operative Stores; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents, &c. Published at the Office of the BUILDING NEWS, 31, Tavistock-street, Covent-garden, W.C.

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THE BUILDING NEWS.

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LONDON, FRIDAY, JULY 12, 1872.

SIR RICHARD WALLACE'S COLLECTION AT THE BETHNAL-GREEN MUSEUM.—II.

WE finished our first notice of these pictures with a charming little work of Rembrandt. We will go on with the fine paintings of this great master. There is nothing finer or more pleasing in portraiture than the magnificent pair (100) representing "Burgomaster Palekan and his Son, and (107) "Burgomaster Palekan's Wife and Daughter." Our notions of Rembrandt, if formed upon many of his etchings, and those pictures where he loved to mark strong contrast of light and shade, would have scarcely prepared one for so much sweetness and refinement as is shown in these two paintings; but the fact is that Rembrandt, like all other great artists, painted what he saw faithfully, and if there was refinement in his subject he could catch it and transfer it truly to his canvas. This fact is shown also in his most delicate etchings. Notwithstanding the extraordinary coarseness and roughness in some, the delicacy and refinement of feeling in others cannot escape the notice of the most careless observer. How true to life he was is not only proved by these two in high life, but also more still in a "Portrait of an Old Lady" (113). You seem to see in it a type of a face you are perfectly acquainted with. You seem to know all about her at once. No. 101, "The Unmerciful Servant," is powerful and less repulsive than some of his larger studies from Bible History. As an example of his *chiar-oscuro*, No. 103 is very good. There is also an extraordinary exhibition of his various powers in the "Head of a Negro" (172). This choice specimen came from the Stowe Collection.

While speaking of ancient portraits of these schools we would draw especial attention to the splendid Vandykes. The most noticeable are Nos. 59, 63, and 116. The two first are from the King of Holland's collection, and leave nothing to be desired either for subject, dignity, finish, or any other great quality. The last is a portrait of the "Wife of Cornelius de Vos," and is a very delightful picture, which may well be compared with a "Portrait of a Lady" (62), by Cornelius de Vos himself, an artist not much known in this country. This particular portrait is one of the best exhibited. Another very rare but better known artist, the skill of whose very faithful pencil adorns these walls, is Gonzalo Coques. There are three groups by him (56, 155, 224), all interesting. They are perfectly true representations of seventeenth century life.

One of the most distinguishing features of this beautiful collection is the amazing number, variety, and quality of the Dutch Cabinet pictures. This particular style of art can certainly be studied better in these galleries than in any other that has hitherto been open to the general public. There have been, here and there, better single specimens exhibited, as in Mrs. Hope's collection, and a few in the Peel collection, but as a whole, we know of no such a display of all the principal artists as is to be seen at Bethnal-green. It is impossible to produce a more excellent or better preserved specimen of David Teniers' best work than (240) "Soldiers Gambling." The colouring is gorgeous, and as fresh as the day it was executed. The peculiar exquisitely crisp touch of this master is shown to perfection in the whole of the details, especially in the armour. The dagger at the left-hand side is quite a study in itself. There would be no difficulty in using it as a real working drawing. The plume also to the helmet is a wonderful bit of painting. There is one other point of interest about this picture. At the back the artist has introduced the subject of the release of S. Peter, which is certainly no addition to the value of the picture, though it is interesting in showing one point in the history of the artist. In his younger days he was famous for his small pictures of sacred subjects. No. 209 is a good instance of this *pasticcio* style, "The Woman taken in Adultery." All the Teniers pictures are of a a high quality. We must not, however, omit to notice one very characteristic and bright specimen (126) a "Cottage by a River," which, notwithstanding its smallness of size is remarkable for its unusual brightness and breadth. This is especially so in the landscape. After Teniers comes Jan Steen, with all his astonishing ability, marred so often by the utmost coarseness and vulgarity. When free from these he is unsurpassable. We know nothing of the kind showing such absolute mastery in every stroke as (204) "The Harpsichord Lesson." The puzzled fingers of the girl and the vigour of the old man who is instructing her are capitally described. If the coarse vulgarity was absent what a picture (219) "The Merry Making," would be: there is nothing more vigorous in the whole building than the young woman in a blue dress playing a sort of bandoline. Both of the other pictures by him are worth studying, especially No. 225, which may possibly have given Sir D. Wilkie the idea of "The Penny Wedding." There is an amazing variety of character and incident in the subject, all faithfully carried out in the most masterly manner. From these two great men, who depended so much upon the crispness and decision of their touch, we pass on to A. Van Ostade, whose handling was so delicate and subtle as often to defy one from discovering how his marvellous effects were produced. There is the fish—true as life—but how he produced it is as hard to unravel as how the colour and hue is produced in nature itself. All three (128, 140, 218) should be seen; all are of very high quality, perhaps the last is most important for its high finish and character. It is simply a group of villagers looking at a fisherman cleaning a fish. It is an example of how interesting a first-rate painter can make the commonest subject. No. 128 is a cottage scene—the fractious child who objects to his food is delightful; and the other a tavern scene, where the quidnuncs of the town have met to discuss the affairs of the nation, treated with much humour, but at the same time with great refinement. There are few more excellent things than the Metzus. No. 234 is one of the very finest and best preserved specimens in the country—a sportsman tired with his morning's work has fallen asleep in front of a house, surrounded by the game he has secured, rather to the amusement of mine host and his wife, who is coming out of the house; her quiet, natural humour, and the utter helplessness of the tired sleeper, could not be better painted. Nothing could be more easy and natural than the attitudes of all the figures in this delightful scene. More powerful still in power of expression, though not nearly so well preserved, is No. 214, where a young woman is writing a letter full of trouble, or, perhaps, to her absent lover, little expecting that an indignant father, or it may be husband, is reading every word as she writes it. Both of these show a marked superiority over most works of this school, in being so much fresher and with an immense amount of finish, still so very free from the least approach to hardness. They should be compared with Gerard Douw's two pictures (125, 193), which are fair representatives of the style of the master, and more especially with the almost matchless display of William Mieris' genius, the best of which is (132) "The Vegetable Seller," and the worst (164) "Joseph and Potiphar's Wife," a subject quite beyond his powers. The exquisite ivory-like finish of all his details will strike every observer. There is a very unusually spirited and fine specimen of Vanderwerf (168), called "A Classic Group." The way the light is thrown upon the beautiful arms and shoulders of the lady surpasses anything we have seen by this favourite, though generally rather tame, artist. There is one other by him in his more usual style of "Venus and Cupid" (156).

By that celebrated but very rare artist, E. H. Vandeneer, there is only one small picture, No. 137. It represents a female artist, and is a good example of his luminous crisp style. For perfectly true representation of Dutch life, without the least poetry, but such as the sun can shed over the commonest object, Peter de Hooghe stands second to none. No. 99 is wonderfully clever, especially in the management of the various lights. No. 105, a woman peeling apples, and giving some of the peel to her little daughter, is perhaps the most pleasing. Our readers must not pass over No. 187, a small, but admirable piece of painting. This is an exceptionally bold and natural production of Gaspard Netscher's brush. We wish we had space to go thoroughly through all that is interesting, but the extent of the collection forbids this. The most interesting Berghems are (191) "The Ferryboat," in which there is a wondrous amount of motion, but the picture has suffered a good deal, and (232) "An Italian Landscape," of very high quality, with beautiful scenery, and varied foreground. The figures and cattle are excellent, especially the tired sheep that is toiling along almost ready to drop. Of course, everything by Paul Potter is perfectly true. One or two are ugly because of the poor breed of cattle represented. No. 235 is a nice quiet bit, but No. 166 is by far the best—a particularly pleasing and valuable work. Few people in England would have expected such fine things from N. Maes as the two boys with hawks, Nos. 82 and 181. There is only one portrait by the great Frank Hals (236), but it is worth a Jew's eye. The man lives. His glorious swagger and matchless bravery of apparel are in their way without a peer. What an engraving Suyderhoof would have made of it, if he had happened to see it! We have already noticed the great Ruben's "Landscape;" there is a large quantity of first-class work by him. His second wife, Helena Forman (83), very like, in quality and handling, to the lady with flop-hat in the Peel collection.

The various sketches are all worth seeing. There is a horrible power and truth in (108), "The Crucified Saviour." The agony of death was, perhaps, never more truly or terribly depicted. Close to it is a finely-coloured and choice "Holy Family," though with very little religious feeling. The figure of our Saviour as a young child is very fine—but only as an ordinary well-made and well-favoured infant.

In our next notice we hope to give some notion of the richest part of the collection—viz., the French school, and the few gems of the English school.

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NOTES ON EARTHWORK.—X.

OBSERVATIONS of the number of men employed in excavating ascertained quantities of earth or rock form the only sure basis upon which to form estimates of the cost of earthwork, adding to the basis so found for simple excavations whatever judgment may dictate for complex cases. The following are some particulars of sewer trenches in the lower division of the New Red Sandstone formation. It consists of a dry, soft, woolly rock, overlaid with about 2ft. of the same rock weathered and disintegrated. Beginning at the lower end of a sewer 2ft. 9in. diameter, of half brickwork, where the rock was harder and tougher than it was eleswhere, the excavation of 316 cubic yards required the following expenditure:—

	£	s.	d.
Ganger, 12 days at 4s.	2	8	0
Excavators, 120 days at 3s.	18	0	0
Watchman, 14 nights at 3s.	2	2	0
Fires, 2 tons of coal at 10s.	1	0	0
Powder and fuse	3	16	0
Sharpening picks	3	0	0
	£30	6	0

$\frac{\pounds 30\ 6\ 0}{316\ \text{cubic yards}}$ = 1s. 11d. per cubic yard.

The next length of which observations were made was the following, the rock being less hard than before :—

	cb. yds.
252 lineal yds. of trench, 6ft. deep, 3ft. 6in. wide =	588
90 ,, ,, 8ft. ,, 3ft. 6in. ,, =	280
	868

	£	s.	d.
Ganger, 25 days at 4s.	5	0	0
Excavators, 254 days at 3s.	38	2	0
Watchman, 30 nights at 3s.	4	10	0
Fires, 5 tons of coal at 10s.	2	10	0
Powder and fuse	3	10	0
Sharpening picks	3	5	0
	£56	17	0

$\frac{\pounds 56\ 17\ 0}{868\ \text{cubic yards}}$ = 1s. 3¾d. per cubic yard.

In both these cases the surplus earth was carted away by a railway company for ballast. This, of itself, indicates something like the kind of ground it was. The item for sharpening picks includes laying them with steel from time to time as required.

The next is the excavation of the trench for a circular brick sewer 2ft. 3in. diameter. Length done 139 lineal yards, of which 24 lineal yards were driven. 139 – 24 = 115 lineal yards open cut. Average depth 11ft., width 3ft., = 422 cubic yards. The ground is—

Red sand to the depth of	7ft.
Loose rock and gravel, and mica shale	4ft.
	11ft.

	£	s.	d.
Ganger, 12 days at 4s.	2	8	0
Excavators, 94 days at 3s.	14	2	0
Watchman, 14 nights at 3s.	2	2	0
Fires, 2 tons of coal at 10s.	1	0	0
Sharpening picks and extras	1	15	0
Filling and carting surplus	6	5	0
	£27	12	0

$\frac{\pounds 27\ 12\ 0}{422\ \text{cubic yards}}$ = 1s. 4d. per cubic yard.

No. 1 heading 11 yards long, 3ft. 6in. high, 3ft. wide, in sand and gravel.

	s.	d.
Miners, 2 days at 3s. 6d.	7	0
Labourers, 2 days at 2s. 9d.	5	6
	12	6

$\frac{12\text{s. }6\text{d.}}{11}$ = 1s. 2d. per lineal yard.

No. 2 heading 13 yards long, same size.

	s.	d.
Miners, 3 days at 3s. 6d.	10	6
Labourers, 3 days at 2s. 9d.	8	3
	18	9

$\frac{18\text{s. }9\text{d.}}{13}$ = 1s. 5d. per lineal yard.

A heading 3ft. 9in. high, 2ft. 6in. wide, in shale, 5⅓ yards long, cost 1s. 3d. per lineal yard.

Another of the same size in the same ground, 11 yards long, 1s. 6d. per lineal yard.

All the foregoing work was done in fields, and the only restoration of surface required was to replace the top soil.

The next is a sewer trench in clay, with running sand in the bottom. The ground required a good deal of timbering, and the sand coming in within 2ft. of the bottom required the sewer to be put in in short lengths, which hindered the excavation. The depth of the trench was 10ft., width 3ft., sewer 2ft. diameter, of half brickwork. Behind the bottom set of walings poling boards were driven, and the joints packed with stable litter to keep back the sand, which, however, it did very imperfectly. On a length of 210 yards there was the following expenditure :—

	£	s.	d.
Ganger, 14 days at 4s.	2	16	0
Excavators, [illegible] days at 3s.	36	15	0
Filling and carting surplus	7	10	0
Restoring surface	2	12	6
	£49	13	6

210 yards × [illegible] yards × 1 yard = 700 cubic yards.

$\frac{\pounds 49\ 13\ 6}{[illegible]}$ = 1s. 5d. per cubic yard.

In excavating a trench for a 9in. pipe sewer in sand and sand-rock, where no powder was used, the length of which was 188 yards, the depth 10ft. 6in., the width 2ft. 6in. at top, and 2ft. at bottom, there were—

	£	s.	d.
Ganger, 15 days at 4s.	3	0	0
Excavators, 133 days at 3s.	19	19	0
Filling and carting surplus	2	7	0
Sharpening picks	1	5	0
Watchman, 18 nights at 3s.	2	14	0
Fires, 3 tons of coal at 10s.	1	10	0
	£30	15	0

$\frac{\pounds 30\ 15\ 0}{188}$ = 3s. 3d. per lineal yard, = 1s. 3d. per cb. yd.

To this should be added 4d. per lineal yard for making good the street paving, making 3s. 7d. In another street there were—

34 lineal yards,	6ft. 6in. deep	2ft. 9in. wide	267 cubic yds.
20 ,,	9ft. 0in. ,,	,,	
45 ,,	10ft. 6in. ,,	,,	
99			

	£	s.	d.
Ganger, 6 days at 4s.	1	4	0
Excavators, 46 days at 3s.	6	18	0
Carting surplus	1	5	0
Sharpening picks	0	15	0
Watchman, 7 nights at 3s.	1	1	0
Fires, 1 ton of coal	0	10	0
	£11	13	0

$\frac{\pounds 11\ 13\ 0}{99}$ = 2s. 4½d. per lineal yard, to which add 4d. per lineal yard for relaying paving, making 2s. 8½d.

$\frac{\pounds 11\ 13\ 0}{267}$ = 10½d. per cubic yard.

In another street, where the ground was chiefly sand, with 2ft. of rock in the bottom, there were 83 lineal yards done with the following labour, the depth being 10ft. 6in., and the width 2ft. 6in. at top, and 2ft. at bottom.

	£	s.	d.
Ganger, 6 days at 4s.	1	4	0
Excavators, 54 days at 3s.	8	2	0
Carting surplus	1	0	0
Sharpening picks	0	14	0
Watchman, 7 nights at 3s.	1	1	0
Fires, 1 ton of coal	0	10	0
	£12	11	0

$\frac{\pounds 12\ 11\ 0}{83}$ = 3s. per lineal yard, plus 4d. for paving, = 3s. 4d.

$\frac{\pounds 12\ 11\ 0}{218}$ = 1s. 2d. per cubic yard.

The average of these three streets is as follows :—

	Per lineal yd.			Per cubic yd.	
	s.	d.		s.	d.
No. 1	3	7	……	1	3
No. 2	2	8½	……	0	10½
No. 3	3	0	……	1	2
Aggregate	9	3½	……	3	3½
Mean	3	1	……	1	1

The next length on which observations were made was in the main street. The work done was 870ft. × 10ft., × 2ft. 6in. = 805 cubic yards.

	£	s.	d.
Ganger, 24 days at 4s.	4	16	0
Excavators, 258 days at 3s.	38	14	0
Watchman, 24 nights at 3s.	3	12	0
Coal, 3 tons at 10s.	1	10	0
Sharpening picks	2	3	0
	£50	15	0

$\frac{\pounds 50\ 15\ 0}{805}$ = 1s. 3d. per cubic yard.

In part of this length the rock was very hard, and had it not been that the use of powder was here prohibited, it might have been used, although in this kind of rock, powder does but little execution, it is so tough and "woolly."

In the next street the quantity was 444ft. × 10ft. 6in. × 2ft. 6in. = 411 cubic yards.

	£	s.	d.
Ganger, 12 days at 4s.	2	8	0
Excavators, 150 days at 3s.	22	10	0
Watchman, 12 nights at 3s.	1	16	0
Coals, 1 ton	0	10	0
Sharpening picks	1	6	0
	£28	10	0

$\frac{\pounds 28\ 10\ 0}{411}$ = 1s. 4d. per cubic yard.

In an adjoining street 177ft. × 10ft. × 2ft. 6in. = 164 cubic yards.

	£	s.	d.
Ganger, 6 days at 4s.	1	4	0
Excavators, 57 days at 3s.	8	11	0
Watchman, 6 nights at 3s.	0	18	0
Coals, ½ ton	0	5	0
Picks	0	7	0
	£11	5	0

$\frac{\pounds 11\ 5\ 0}{164}$ = 1s. 4d. per cubic yard.

In this case the pick-sharpening seems to have been much less than in others. It may have been that a new lot were in use.

The removal of the surplus earth in these cases cost nothing to the work, being done gratis by builders, paviours, and others. The best way of consolidating sand filled into a trench is to water it moderately. It may then be punned also if thought well, but the watering is the chief thing. The paving over these trenches done once required no further repairs.

An outfall sewer 3ft. 3in. diameter, of brickwork 6in. thick (purposely moulded bricks) was laid at an average depth of 6ft. 6in., 471 yards in length, about two-thirds of the length of which was through meadows, and the remainder in a turnpike road. The whole quantity of excavation was 1,446 cubic yards. The ground is alluvial, consisting of fine clayey earth and silt. The cost of the earthwork was as follows :

	£	s.	d.
Ganger, 19 days at 4s.	3	16	0
Excavators, 236 days at 3s.	35	8	0
Watchman, 40 nights at 3s.	6	0	0
Coals, 5½ tons at 10s.	2	15	0
Carting surplus earth—horse, cart, and driver, 43 days at 7s.	15	1	0
Sharpening picks	0	3	0
	£63	3	0

$\frac{\pounds 63\ 3\ 0}{1446}$ = 10½d. per cubic yard.

The last-mentioned sewer was continued along the road of a diameter of 2ft. 9in., the thickness being, as before, 6in. The length is 414 yards, and the ground continues the same. The average depth is 5ft. 9in. The quantity of excavation, 992 cubic yards.

	£	s.	d.
Ganger, 16 days at 4s.	3	4	0
Excavators, 165 days at 3s.	24	15	0
Watchman, 18 nights at 3s.	2	14	0
Coals, 2½ tons at 10s.	1	5	0
Carting away surplus earth—horse, cart, and driver, 45 days' work at 7s.	15	15	0
Sharpening picks	0	8	0
	£48	1	0

$\frac{\pounds 48\ 1\ 0}{992}$ = 11½d. per cubic yard.

In the last two instances the surplus stuff was easily disposed of. The farmers of the neighbouring land allowed it to be carted on within a distance of 300 yards, and they spread it over the grass land. This, it was considered, materially reduced the cost of the work.

A brick sewer, 2ft. 6in. diameter, half-brick thick, length 80 yards, through clay and gravel, in a very narrow road, average depth, 8ft. 6in. ; quantity of excavation, 245 cubic yards.

	£	s.	d.
Ganger, 5 days at 4s.	1	0	0
Excavators, 72 days at 3s.	10	16	0
Watchman, 5 nights at 3s.	0	15	0
Coals	0	7	6
Carting away surplus earth—horse, cart, and driver, 20 days at 7s.	7	0	0
Sharpening picks	5	0	0
	£20	3	6

$\frac{\pounds 20\ 3\ 6}{245}$ = 1s. 8d. per cubic yard.

Here was water, but not a very large quantity. The narrowness of the road was the chief hindrance to progress. The cost was also increased by the difficulty of finding a tip for the surplus stuff, it being unsuitable for the land.

A brick sewer 2ft. 3in. diameter, of half brickwork, in fields, in clay, length 132 yards, average depth 4ft. 6in., quantity of excavation 198 cubic yards.

	£	s.	d.
Ganger, 4 days at 4s.	0	16	0
Excavators, 36 days at 3s.	5	8	0
Carting away surplus—horse, cart, and driver, 9 days at 7s.	3	3	0
	£9	7	0

$\frac{\pounds 9\ 7\ 0}{198}$ = 11½d. per cubic yard.

Brick sewer 2ft. diameter in meadows, clay and gravelly clay, average depth 5ft. 10in., length 452 yards, quantity 807 cubic yards.

	£	s.	d.
Ganger, 14 days at 4s.	2	16	0
Excavators, 201 days at 3s.	30	3	0
Carting away surplus—horse, cart, and driver, 26 days at 7s.	9	2	0
	£42	1	0

$$\frac{\pounds 42\ \ 1\ \ 0}{807} = \text{1s. 0½d. per cubic yard.}$$

Here, again, the surplus stuff, although not so good for the land as that near the outfall sewer, was disposed of within a few hundred yards.

In disposing of surplus earth the number of horses and carts required may be calculated on the following data:—Three men fill a cart holding a cubic yard in 14 minutes. The horse travels at the rate of about 60 yards per minute. One minute may be allowed at each end of the journey for tipping and turning. The cart is, then, 12 minutes on the road, 6 each way, in order to keep 3 fillers at work. Then 6 × 60 = 360 yards, the distance to which the stuff can be taken. Thus 2 horses and carts, and 2 drivers, with a tip not exceeding the distance of 260 yards from the work, are required for every 42 cubic yards removed in a day of 10 working hours; for if 3 men fill a yard in 14 minutes, they will fill nearly 43, but (say) 42 yards in 10 hours. If the wages of the fillers be taken at 3s. a day, and each horse, cart, and driver at 7s., the cost of removing the surplus to this distance is 6½d. per cubic yard.

But as the length of lead is generally a fixed distance, suppose it be half a mile, = 880 yards, or (say) 900; here the double journey is 1,800 yards, which, divided by 60, gives 30 minutes as the time in which it will be performed, that is, 15 each way. Therefore, when the first cart has arrived at the end of the journey, the second will be ready to start, having been filled while the first was going. There must, therefore, be a third cart, to be filled while the first is returning, which will be ready to start by the time the first has returned. Thus, to keep 3 fillers at work when the tip is half a mile off, 3 horses and carts are required, and for this 42 cubic yards will be removed in a day. Taking wages and horse-hire as before, the cost is 8½d. per cubic yard.

For long journeys, however, it is better to have a larger cart and a pair of horses. A pair of horses will take 2 cubic yards of earth of an average weight (but only 1½ cubic yards of gravel) 10 miles a day, and return with the empty cart. If the lead be 1 mile they will go 10 turns a day = 20 cubic yards; if 2 miles, 5 turns a day = 10 cubic yards; if 2½ miles, 4 turns a day = 8 cubic yards.

The cost of horse work may be estimated as follows. Taking the price of hay at £5 10s. per ton, say 36 trusses; oats at 30s. per quarter, weighing 336lb.; beans at 50s. per quarter, weighing 532lb. Each horse will require

	Per week.		
	£	s.	d.
140lb. of hay, say 2¼ trusses, at 3s.	0	6	9
96lb. of oats, at 1d.	0	8	0
24lb. of beans, at 1⅛d.	0	2	3
Suppose the horse and harness to cost £40—interest on outlay, and depreciation, 6½ per cent. per annum, 52s.	0	1	0
Harness	0	1	0
Repairs and shoeing	0	0	6
Farriery and medicine	0	0	6
	£1	0	0

The value of dung pays for the straw.

	£	s.	d.
Two horses at 20s.	2	0	0
Carter	0	15	0
	£2	15	0

Five days a week are as much as can be reckoned on on an average of seasons.

$$\frac{\pounds 2\ \ 15\ \ 0}{5} = \text{11s. per day.}$$

A single horse, cart, and driver may be taken at

	£	s.	d.
Horse (per week)	1	0	0
Driver „	0	15	0
	£1	15	0

$$\frac{\pounds 1\ \ 15\ \ 0}{5} = \text{7s. per day.}$$

FIRE SURVEYS.[*]

Captain Shaw, in a little book just published, bearing the above title, mentions the principal points to be taken into consideration in making an inspection of a building with the view of ascertaining its condition with regard to danger from fire.

The first point is the general description of the premises, whether they consist of one or more parts, and their communication with each other, the use to which they are applied, and the nature and date of alterations since the original erection. Caution should be used in the use of the term "fireproof." Captain Shaw truly observes that with regard to risk of fire the contents of a building are often of much greater importance than the building itself, and that a structure which would be perfectly fireproof as an office or private dwelling-house might become most dangerous if converted into a factory or warehouse. He lays down as a rule that a building to be truly fireproof should be divided into compartments, and so constructed that the contents of any one compartment might be consumed without calcining, melting, or otherwise destroying the surrounding horizontal and upright partitions, and therefore without communicating fire to other rooms or floors. The situation of a building is an important point for consideration. Thus, a dwelling-house on the top of a precipitous hill, or a warehouse in a narrow street that would only admit one engine near enough to work on it, though both might be near abundant help in the way of firemen, water, and engines, yet they would practically be beyond the reach of assistance in the event of a conflagration. The distance apart of buildings should be considered in proportion to their height. As a rule, Captain Shaw considers a distance should intervene equal to half their combined height; thus, for instance, two buildings respectively 60ft. and 30ft. high, might safely occupy opposite sides of a street 45ft. wide. The foundation, area, height, shape, and cubical capacity of buildings should all receive careful attention. With a well organised and equipped brigade, it is found that 60ft. is the greatest height at which a building can be quickly protected, and that the cube of 60, or 216,000ft. cubic feet, is the largest cubical capacity which can be protected with any reasonable hope of success after a fire has once come to a head.

It is in the construction of buildings, however, that architects and builders will most care to hear what Captain Shaw has to say. Bricks, in his opinion, well burned, or some other substance—concrete, for instance—composed of ashes, slag,[†] or other materials which have been previously burned, ensure the highest degree of safety as a wall material. Mud forms an excellent fireproof wall; but unless of great thickness it gets out of shape, and if this disadvantage be avoided by the erection of a frame within it, the frame itself becomes a source of weakness, as, if made of metal, its expansion and contraction, though similar in kind to that of the mud covering, differ in degree, and lead to fractures sufficient in extent for the admission of smoke and flame. Stone is the worst fire-resisting material of all; although, when embedded in cement or thoroughly good mortar, it resists heat gradually applied, it will even then become calcined, and will crumble to so great an extent as to be unable to carry a load afterwards; and in the case of any sudden great change of temperature, it cracks instantly without notice, not only leaving a passage for smoke and flame, but in many instances causing the wall to fall.[*] Bad mortar and cement are frequently causes of heavy loss, from their failure to bind the other materials in such a manner as to prevent buckling. Walls, though strongly built in themselves and of good materials, are yet likely to fail if not firmly bonded into cross-walls, and Captain Shaw states that most firemen of experience can bear witness to numerous instances of a front and side walls becoming disconnected at the corner, each falling out separately, but breaking only upon contact with the ground. Instead of buttresses, tie-rods, and the numerous devices which have been adopted for making walls stand upright, Captain Shaw advises a zig-zag form of construction with a strong bond at the angles. He points out that in all boilers or other vessels constructed to resist heavy pressure, it is always deemed most desirable to avoid having any large flat surfaces; but, notwithstanding this, whole lines of houses are built with straight front and back walls, although a zig-zag form of construction would be less inconvenient and expensive. Corner buildings supported on iron alone are dangerous in the extreme. Balconies, if of wrought iron or any material proof against immediate destruction by heat, are useful for the saving both of life and property; if, however, of wood, or any combustible substance, they only serve to communicate fire from one building to another.

Architectural shams are justly held responsible for many misfortunes attendant on fires. "Thus, for instance," Captain Shaw remarks, "the walls of a most imposing and pretentious building of sufficient thickness, and apparently constructed of sound stones, are found to crack at an early stage of a fire, and perhaps to fall down altogether, and then it is discovered that they have been only a deception, having been constructed externally of stone and internally of brick." Uniformity of construction, and to a very large extent precise uniformity in the power of the materials used to carry weight, seems absolutely necessary to ensure uniform strength in walls. The elasticity of iron should be more generally allowed for where it is employed in the shape of bressummers, beams, or joists. Cornices, always dangerous in case of fire, are less so if built with an equal weight of material inside and outside the centre of the wall, so that their tendency is to balance and not to fall in either direction; the greater weight, if any inequality is allowed, should be on the inside, so as to prevent loss of life.

Roofs should be more generally constructed with means of access from the inside. Enormous lengths of roofs are frequently constructed, without divisions, of massive timber in a very dry condition. The risk thus entailed may, Captain Shaw thinks, be lessened by completing existing walls and chimney-stacks so as to convert them into fire walls. Corrugated iron roofs might also in many cases be substituted for the massive timber and slate roofs at present in vogue. For stairs, wrought iron is asserted to be the safest material, and next come the hard woods, such as oak, elm, ash, mahogany, &c.; stone Captain Shaw considers altogether ineligible, and severely condemns the various legislative enactments in which its use is enjoined as "a fire-proof material." Floors, of whatever material, should always be air and water tight, and might with advantage be caulked like a ship's deck, only with dry oakum without pitch. For the various other matters of detail into which Captain Shaw enters our readers will do well to consult his book.

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[*] "Fire Surveys," by E. M. Shaw. London: Effingham Wilson.

[†] Such a material is used by Messrs. M. Allen & Son, the builders of the Industrial Dwellings for the Industrial Dwellings' Company, and was subjected to a severe ordeal in the fire at Sir Sydney Waterlow's warehouse, in Hill-street, Finsbury, in October last year. (See Building News, Oct. 27, 1871.) The material consists of Portland cement and breeze, coke refuse, or slag, in the proportion of from 5 to 7 of the former to 1 of the latter. At Finsbury we saw window dressings of this material intact where stone had been split and shivered in all directions, and where even the brick walls were rent and shattered.

[*] The objections of Captain Shaw to stone are fully borne out by our remembrance of its behaviour in the building above referred to. The stone had hardly anywhere remained intact.

CRITICAL NOTES ON GREAT ITALIAN ARCHITECTS.—XV.

By J. B. Waring.

GIORGIO VASARI AND GIACOMO DELLA PORTA.

WHENEVER Art is studied, the name of Giorgio Vasari will be loved and respected, if only for his delightful "Lives of the Painters, Sculptors, and Architects," to which, with all its inaccuracies and amusing traits of personal feeling, we are indebted for knowledge which would otherwise have been lost to us. His career as a painter, long and active, does not come within our province, and the student will find it recorded at length amongst "the Lives." As an architect our Giorgio holds no mean position, and his works, important in themselves and excellent in design and detail, well deserve our attention.

Giorgio Vasari sprung from a family which had already produced artists of merit—viz., Lazzaro Vasari, the painter (1380—1452), and his nephew, the celebrated Luca Signorelli; and Giorgio Vasari, our artist's grandfather, who appears to have been an adept in executing red and black vases of the Etruscan kind, the process of which he is stated to have discovered. His sons also followed the same occupation, and his own father, Antonio, who taught him the rudiments of art, was born at Arezzo in 1512, and studied under Guglielmo du Morsiglia, the glass-painter. By Passerini, Cardinal of the neighbouring town of Cortona, he was taken to Florence in 1524, and studied the art of design there "under Michael Angelo, Andrea del Sarto, and others." His first painting at Arezzo was executed in 1528, and in the same year he commenced studying the goldsmith's art, which he abandoned very shortly, and returned to painting, which he studied and practised at Pisa, Arezzo, and Rome, where he also copied assiduously the best works in architecture and sculpture; indeed, his industry appears to have been unceasing, and returning to Florence he obtained the favour of the Medici family, and when he was little more than eighteen years of age, received a fixed stipend from the Duke Alessandro di' Medici. From this time forward he was continually employed in the service of the Medici family, and was enabled by his labours to set up his family, who had till then been in straitened circumstances. Perceiving the Duke Alessandro "to be principally interested in fortifications and buildings of various kinds," Vasari set himself specially to study architecture, and on the occasion of the Emperor Charles V.'s visit to Florence in 1536, he was appointed with Sansovino, Tribolo, and others, to prepare the triumphal arches and architectural decorations, his labours being substantially rewarded and highly appreciated by the Duke. On a second visit to Rome, in 1538, he for some months assiduously studied and drew the ancient architectural remains, which he says proved subsequently of the greatest service to him, and which, coming under the notice of Michael Angelo, led him to recommend Vasari strongly to apply himself more closely than ever to architecture. Under Pope Julius III. (1550—55), Vasari says he was "kept constantly in action, either for architectural designs or other works," and asserts that with himself "originated the first arrangement and plans of the Vigna Julia (Villa Papa Giulio). "It was I," he says, "who made drawings of all the fancies which Pope Julius invented for that place," and that these "were afterwards examined and corrected by Michael Angelo," Vignola carrying out the designs, amongst which Vasari says that the lower fountain is his own design, executed by Ammanati. It would be difficult, perhaps, to assign what is exactly due to the various architects and sculptors employed on this well-known building, which, however, is no doubt, in the main, Vignola's work. He does not appear to have liked his position at Rome, and in 1555 returned to Florence, and entered into the service of Cosmo di'Medici, and shortly afterwards prepared a model of his greatest architectural work, the remodelling and enlargement of the "Uffizii," which he commenced building in 1560. This building alone, from its importance and architectural beauty, is sufficient to prove that Vasari was an architect of unusual excellence. Indeed, the whole arrangement and carrying out of this large block of buildings, with its imposing exterior, grand staircases and halls, evince merit of a very high order, and when to this is added the fact that Vasari executed many of the frescoes which adorn it with his own hand, few artists can show a more complete example of what education and industry can effect.

This building, says Vasari, was one of the "most difficult and dangerous" he ever erected, some of the foundations having to be laid in the river; he also constructed the great corridor which connects the Uffizii with the Pitti Palace, and which now forms so delightful and instructive a gallery of drawings by the old masters. About this time also he was entrusted with designing and erecting all the triumphal arches, &c., on the occasion of the marriage of Francesco, eldest son of Cosmo I., with the Archduchess Joanna, daughter of the Emperor Maximilian, besides the machinery used for the festivities in the Church of San Spirito; and was employed in various important alterations at the Palazzo Vecchio, amongst which was raising the height of the Sala del Consiglio about 25ft., and effected such changes as quite to change the appearance of the interior. In the year 1565, he designed the Church and Palace of the Knights of S. Stephen, at Pisa, in which are also various paintings by himself illustrative of the saint's life. According to Milizia, the present façade of the church is of later execution by Busutalenti. The interior is fine and imposing in effect, assisted by some excellent ceiling paintings relating to the wars in which the Knights were engaged, and various trophies taken from the Turks in the wars of the seventeenth century. The façade of the conventual palace itself is ornamented in "grafitto," with arabesques executed by Forzori under Vasari's directions. It is astonishing that this very simple, effective, and artistic method of decoration is not practised in this country: a few works in coloured compo. of the Late Elizabethan period, scattered through the country, forming poor examples of the effect of which it is capable, and which is used to such excellent purpose in Florence and Rome.

Overpowered by unceasing and anxious work, Vasari now obtained permission to travel for some months, and found recreation in visiting many of his brother artists throughout Italy. At Rome he had an interview with the Pope, upheld Michael Angelo's plans for building S. Peter's, and received the Pope's permit to build and endow a family chapel at Arezzo, which he designed, painted, and endowed himself. At Arezzo, also on the Piazza, the fine Loggie dei Mercanti were designed by him, and are remarkable for their excellent effect and detail. His other works are the choir, behind the altar, of S. M. Novella, Florence, and a similar work with new chapels at Santa Croce, and he erected the cupola of S. M. dell' Umiltà, originally designed by Bramante. He made a model for the great Mausoleum at San Lorenzo, which, however, does not appear to have been executed, and designed, about the year 1572, a Palace for the Medici at Capraia, a small church at Colle Mongoli, and some fountains at Castello. He died at Florence in 1574, "crowned with fame and honours, and very sincerely lamented." As a painter Vasari's power of invention was great, and his industry unwearying; but we think he takes a higher position almost as an architect, and it is to be noted that his designs, which are always effective and excellent in detail, are comparatively simple in style, and are quite free from those irregularities and *capricci* which characterise the works of his professed model, Michael Angelo. The prudence which distinguishes Vasari may have been the cause of this, and what he may have admired in the great master he wisely did not venture upon himself. In consequence there is a staid regularity, a reliance on proportion and careful detail in his works which deserves great praise. It is pleasant also to remember that the niches of the Loggia of the Uffizii are now filled in with marble statues of some of those great artists whose fame he preserved in print.

Giacomo della Porta, of Milanese origin, commenced life as a sculptor; he then studied architecture under Vignola, and executed many important works at Rome during the sixteenth century. He was one of the official architects at S. Peter's, and, according to Milizia, "executed the idea of Michael Angelo in vaulting the cupola. . . . Sixtus V. commissioned G. della Porta and Dominico Fontana to raise the cupola in twenty-two months; 600 men, working continually during the day and at times at night, completed it. These two architects gave a little more height to it than was in the original design of Michael Angelo." The façade, cupola, and high altar of the Church of the Jesuits, one of the most lavishly rich in Rome, were designed by him, the other portions of the church being due to Vignola; but it is now so overlaid with tasteless ornament that the simple beauty of the old masters is quite overlaid and destroyed.

By Giacomo also is the Mausoleum of Cardinal Alessandrino in S. M. Sopra Minerva.

His façade of the Church of S. Catharine "de' Funari" is excellent both in design and detail.

The façade of San Paolo alle tre Fontane was built from his designs in 1590. This church is remarkable as containing the three fountains which, according to the legend, sprang up where S. Paul's head was struck off. By Della Porta were designed, also, the Chigi Palace, the vestibule and courtyard of which are very fine, and the court of the Collegio della Sapienza, commenced by Michael Angelo. In this work, dating about the year 1576, his style harmonises well with the massive character of the older building. He designed the river front of the Farnese Palace, quite equal, in our mind, to the rest of the building by San Gallo and Michael Angelo, and continued M. Angelo's designs for the Capitoline Palace, which were finally completed by Rainaldi. He rebuilt the Porta di San Giovanni, and to him is due one of the most picturesque fountains in Rome—that of "the Tartarughe," or Tortoises, the four bronze picturesque figures of which were executed by Taddeo Landini, a Florentine sculptor and architect, who was much employed at Rome during the Pontificate of Gregory XIII. (1572—85).

The Church of San Luigi, of two orders, Doric and Corinthian, and the Church of the Greeks; the Palace of the Marchese Gerlupi (left unfinished); the "majestic" Marescotti Palace, all at Rome, and the "elegant" Gottofredi Palace at Venice were designed by him. The Church of San Luigi was built by him by order of Catherine di'Medici, in 1588. The Villa Aldobrandini, at Frascati, was commenced from his designs, and it was on returning from a visit to the works that he was seized with a sudden illness, and died, aged 65, in 1604, beneath the shadow of the Porta di San Giovanni, of which he had been the architect.

Although Vasari makes no mention of Giacomo della Porta, he gives many particulars of Fra Guglielmo della Porta, who assisted Michael Angelo in much of his sculpture, and there were besides a Gian Giacomo della Porta, sculptor and architect to Milan Cathedral, and other artists of the name worked in Rome, to which family the subject of our paper may have belonged. Our account of Della Porta is mainly founded on Milizia's notice of him, which appears to be almost a verbatim transcription from Monaldini's "Vite de' piu celebri architette," published at Rome in 1768.

The style of this architect has much in it of the boldness and originality of his great predecessor Michael Angelo, but presents none of the more daring novelties which characteristic his style. He is more prudent and more correct, and appears always to have kept in mind the soberer and severer examples of his first master, Vignola, accompanied, however, with an eye to pictorial effect which was in his day becoming a marked feature in the art of architectural design.

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SCHOOL PLANNING.

THE following discussion followed the reading of Mr. Robson's paper on this subject at the Architectural Association. We published the paper in our last impression :—

The PRESIDENT (Mr. Rowland Plumbe) said he was glad to see several gentlemen in the room whose special facilities for gaining knowledge on many of the points raised in the paper would entitle their remarks to particular attention. He would first call upon a well-known member of the London School Board, the Rev. Canon Cromwell.

Canon CROMWELL said he did not know that he could add very much to what Mr. Robson had said. He had known Mr. Robson for many years, and he was sure that any plans which were suggested and any opinions which were offered by that gentleman would be well-considered, and worthy of great attention. With respect to school-rooms, he (the speaker) had been studying the subject for a great many years, and was conversant with the American, German, and Swiss systems. He had seen the schools of Germany and Switzerland, and he would first speak of the schools of Zurich. Mr. Matthew Arnold, no less experienced as a school inspector than renowned as a man of culture, had stated that the schools of Zurich, and the education given in those schools, were superior to anything he had seen on the Continent. Now a school in Zurich was nothing but a series of class-rooms: there was no one large room in which all the children were to be gathered together, and many of the schools in the town were buildings that had been adapted from other purposes, and not built specially for schools. One of the most successful of the Genevan schools which he (Canon Cromwell) had visited was formerly what would correspond to a town-hall with us. In that school the rooms were of all sizes and almost all shapes. In those rooms the desks were generally arranged so that they were all directly facing the teacher. Supposing, as was generally the case, the room was an oblong, the teaching was given, so to speak, "end-on"—*i.e.*, the teacher occupied one end of the room. Down the centre (longwise) of the room was a gangway broad enough to allow the teacher to pass up and down and readily see what was doing at each desk. On either side of this gangway short desks, holding not more than five scholars, were ranged. These desks did not touch the side walls, for on either side of the room were gangways of about the same width as the central gangway. These arrangements offered very great facilities for the master to inspect the work (such as drawing, &c.) being done by the pupils. When the master was in his place at the end of the room he was able easily to see every one of his scholars, and the scholars were all able to see the master. A very practical point to be borne in mind in school planning was to take care that the field of vision right and left should not be so great that the teacher would have any difficulty in seeing well into the faces of all his scholars. Teachers of experience always knew when they had made a subject plain to the children; if the outlook was intelligent the teacher was satisfied that he had made himself understood, if not he knew he must go over the matter again. Although some if not most of the school-buildings in Zurich were not built specially for schools, he (the speaker) had visited one school there which had only very recently been built on purpose for a school. This school, in which was to be seen the outcome, as it were, of a good deal of the thought of the teachers of Zurich, was close to the minster, and was used for the education of young girls belonging to the middle class—what was called a secondary school. It was built very much on the plan of one of the colleges at Oxford or Cambridge, and was simply a quadrangle, the lower rooms being used for general purposes, and the rooms on the first and second floors being used as class-rooms. On the interior of the quadrangles, and one above another, were corridors or galleries running round the building, open to the air, but protected from the weather. On to these galleries the doors of the different class-rooms opened. The arrangement was similar, indeed, to that of some of the old London inns, in which the bedrooms opened on to galleries or corridors running round the central court-yard. The class-rooms were oblong in form, the lighting being always from one side, and the desks being ranged longwise with the room, and not crosswise. He was of opinion that the feeling in Germany generally was in favour of long rooms, with blocks of desks of not greater width than sufficient to seat four children in a row. In Germany it was found that fifty or sixty children thus disposed could be easily taught by one teacher, the desks being divided into two groups by a gangway down the middle of the room. As to American schools the class-rooms were frequently square in shape, and the buildings were arranged somewhat in the same manner as blocks of factory buildings are in England—*i.e.*, side by side, but with a broad passage between them. There were generally three square rooms on each side of the passage. This passage had a window at each end, so that there was a current of air through it. The second and third floor rooms opened into the passage in the same way as the ground floor rooms. Each of the class-rooms was ventilated directly from this passage as well as from its side windows. In some of these schools the desks were arranged somewhat differently from the German method, being arranged to seat two children only. The whole of the floor of an American school was studded with these single and double desks, one teacher having charge of a whole section or block. The Lyceum, in Strasburg (where children of all ranks were taught everything from a knowledge of the alphabet up to qualifications for the universities), formed three sides of a quadrangle, which plan he (Canon Cromwell) considered to be far preferable to a complete quadrangle, as it allowed of the much freer circulation of light and air. There were stairacses at each of the corners. This building was three or four stories high, and comprised a series of separate small rooms: there was not a single large room in it. He believed that the Germans and Americans were quite right in having series of class-rooms. As to English schools, owing to paucity of funds, it had frequently been the practice to erect buildings to serve for other purposes than for the single purpose for which they were more especially built. Many schools had been built to serve also as places for public worship on Sundays; but experience had shown that such buildings did not serve either one purpose or the other thoroughly well. By the Lancasterian system it was sought to arrange the classes on each side of the room, in such a manner as to be easy of control. The Education Department first of all began to recommend that boys should be ranged always along one wall, and never so that the children in one class could look into the faces of the children in another class. At Leeds, he understood that the School Board was proceeding upon the principle of having broad schools instead of narrow ones. In Church of England (or "National") schools of most recent erection there was a constant disposition evinced to place the children along only one side of the school, and to diminish the size of the rooms. At S. Mark's College, Chelsea, with which he was connected, the desks were ranged along only one side of the class-rooms. He was an advocate for the desks being in groups of four deep rather than three deep, especially if the back rows were slightly raised above the front ones. The desks should be placed as close together as possible, and no desk should be longer than 13ft. or 14ft. at the very utmost stretch, otherwise the field of vision would be too great, and the teacher would not be able to effectually control the class. In the last school he had had built in connection with S. Mark's College (of which school Mr. Quilter was the architect) he had introduced solid instead of hollow flooring, with a view of diminishing the resonance and reverberation, and this expedient had been successful. As to lighting the class-rooms from behind the scholars, it was done at S. Mark's, but Dr. Leibrich, the celebrated German oculist, had given it as his opinion that many of the scholars would go blind in consequence of the light being admitted behind them. He (the speaker) did not believe that, especially as that opinion was not corroborated by past experience. For warming he considered that there was nothing so good as the Galton stoves. As to the windows, instead of having sashes or windows opening on pivots, he had come to the conclusion that the windows which opened inwardly on a hinge fixed to the inside of the transom (like many church windows) were the best. With such windows as these the schoolmaster was able to have the windows open almost constantly for nine or ten months of the year, and so the air of the room was always kept sweet. The best place to admit fresh air was at the top of the room, and the best way to get rid of foul air was to extract it from the bottom of the room.

The PRESIDENT said he thought the Association would feel deeply indebted to Canon Cromwell for having so ably supplemented Mr. Robson's paper. There were several architects in the room who had lately been engaged in competing—some of them successfully—for the erection of Board schools in London, and he thought the present was a golden opportunity for some of those gentlemen to impart some of the experience they had gained. He should like to hear what Mr. Roger Smith had to say, especially with regard to the Prussian system of school arrangement.

Mr. T. ROGER SMITH said that the Chairman had alluded to a circumstance which might be expected to have a rather embarassing effect upon the majority of those who might be asked to speak. They were all engaged in fighting one another in the keenest manner. The truest and best of friends had been made enemies of each other by the School Board, and each of them thought he had some little private "bit" which would enable him to distance his competitors, and the last thing he would do, therefore, would be to speak of it on that occasion. (Laughter.) As a rule, however, such special bits of skill turned out to be utterly worthless, and if any one present fancied he had something special, the best thing he could do would be to ventilate it on that occasion, and have it thoroughly exploded at once. (Laughter.) He might say that he thought he had nothing very special to mention. With regard to German schools, he did not know that he could supplement what Canon Cromwell had so well said. But, besides the ordinary arrangement of German schools, where the school building made a square block, two rooms deep, and divided into three portions by two staircases, each extending from back to front, there was another plan very much used, which approximated very closely to what Canon Cromwell described as the American arrangement, *i.e.*, a plan in which there was a great central corridor with rooms right and left of it, and a staircase at each end. German schools always had two staircases—one for girls and the other for boys, and the division of the school was vertical and not horizontal—in other words, the boys and girls did not occupy distinct floors, but distinct halves of the building divided vertically. Some of the rooms in each half of the building could easily be made, however, to open on to both staircases in an emergency. The plan would be difficult of extension beyond the scheme which gave eight class-rooms on a floor, with access to every room from the staircase independently. A large hall was usually provided midway between the two staircases. The hall was intended not so much for teaching in as for collecting the children together on certain occasions, such as when the prizes were presented, and it was only made large enough to hold a moderate proportion of the whole of the children of the school. The other rooms were generally of uniform size, and it was considered that 60 was about the maximum number of children who ought to be taught in any one room by one teacher. He thought, with regard to the arrangement of rooms, most German authorities were indifferent as to whether they should be end-lighted or side-lighted; but in the Prussian system each class was almost always so arranged that the light should fall upon the left-hand side of the children; this was a matter of great importance, for where children were learning to write or cipher left-hand light was by far the most convenient. It ought always to be made a rule in planning class-rooms that if more than one row of windows could be got, a left-hand light should be secured as well as a light from behind the children. The limit of size of Prussian class-rooms had been reached partly by the number of children which one teacher could control, and partly by one or two other curious considerations which might sometimes be overlooked. One of these considerations was the distance to which it was supposed a child of ordinary powers of vision could see; the room must not be so large that a diagram with letters or lines of specified size would be indistinct to the most remote child. Again, a room must not be so long that, if lighted from one end only, the children furthest from the lighted end would not receive a perfectly ample allowance of light, especially on a dull day. Nor must the rooms be so large as to cause great fatigue to the teachers. All these requirements seemed to point to a room whose maximum dimensions should be 26ft. or 27ft. by 20ft. or 21ft. This would be something like a normal class-room. It was very desirable to have easy means of access to all the children, so as to watch their work, and it was desirable that none of the benches should touch the walls, so that the master or mistress should be able to go all round the benches and see what each of the pupils was doing. Going from these details of the Prussian system to the general question of school buildings in England, and looking at the alterations which had successively taken place in a document which he and some others had had in their hands, and issued by the London School Board, it appeared clear that the importance of teaching in class-rooms was gaining upon the minds of members of the London School Board. All who had had any kind of practical experience in teaching children had found that one great point necsssary to be attained to ensure success was that they should be cut off as far as possible from all extraneous influences, and that there should be nothing but the teacher and children together. This was a secret well worth bearing in mind when scheming for schools. As far as possible each individual batch of children and their teacher should be detached from the others. Curtains had been used to separate one class from another, but teachers of experience said that a class taught in a class-room got on far better than when taught in a large room with other children, though divided off from the rest by curtains. He believed that this separation of the children into groups could not be carried too far as long as the means of general superintendence were also secured. Teaching in classes was very often entrusted to teachers of moderate judgment and capacity. Sometimes the class was too many for the teacher, sometimes the subject was, and now and then the teacher would not be able to maintain proper discipline in his class. It was necessary that there should be thorough supervision by the master, so that when a class was getting into trouble he would be able to set matters right. There was no doubt that in the large schools in this country, the individual teachers derived an immense amount of moral support from the constant watchfulness of the masters; but in the German or class-room system we needed teachers who could go entirely alone. In the case of each school it would depend very much upon the class of children got together how large a portion of teaching ought to be given in separate class-rooms, and how large a portion of instruction might be given in a general room where supervision was constant and easy of accomplishment. Some few points of importance had arisen in the course of the recent competitions for Board Schools in London. One was the question of conveniences for children. He had, as a rule, advocated that the privies and closets should be in buildings detached from the main building. It was no hardship to a child, if it was well enough to come to school at all, to have to go up and down stairs and across a yard. By this means the effluvium was got quite away from the main building. But there was this drawback to the plan: Where you had an arrangement in which a number of children had to go away from the floor altogether it was less easy to secure discipline. Some architects, on this account, advocated the conveniences being placed on the same floor, but separated by an open corridor of some kind. Another point was the question of the complete ventilation of school-rooms. They were for many hours very closely crowded with children, whose circulation was very quick; the rooms got filled with warm air, even though there was a certain amount of sensible or insensible ventilation at work all the time the teaching was going on. What was wanted was the means of changing the entire air of the room quickly and thoroughly during the intervals of teaching. This could be effectually done in a room lighted from the two ends and one side by opening the windows wide, and so causing a through blow, and carrying the stagnant air away. He believed, however, that some of the school managers did not think so, but thought that a school would never be efficiently ventilated unless it had windows at both sides. Another point was as to the best and most efficient way of making a sliding partition which should be to some extent sound proof, easily manageable, and capable of being brought forward or pushed back without much noise, delay, or trouble, and which should, with something like adequacy, divide a portion of the school into two when it pretended to divide it. Two or three different schemes had been tried. There was one other puzzle in schools where a large proportion of the teaching was in class-rooms, but where children were also to be taught collectively during a part of the day, and it was this: how to provide for the assembling of all the children in the school together in one part of it without interfering with the arrangement of desks. There must not be any arrangement which would necessitate the seats and desks being moved except, perhaps, by being moved a little closer together. The best solution of this problem he had heard of was the introduction permanently of an additional seat between each of the desks, so that, in fact, two of the seats would stand together, one of which, when the classes were being held, would remain vacant, while the other would be occupied by the scholars at the desks. Of course, this would make a block of four desks stretch over a wider floor area, but no more satisfactory solution of the problem had yet occurred to him. He had very much pleasure in bearing testimony to the valuable nature of the paper read by Mr. Robson, and of Canon Cromwell's remarks.

Canon Cromwell asked what was the mode of warming adopted in Prussian schools.

Mr. Roger Smith replied that in the basement of the building was a general heating apparatus, which discharged hot air into the room, always fresh, while flues carried off the vitiated air by outlets near the ceiling into the open air. In very few cases, if any, did they pretend to have anything like open fireplaces.

The President said that although Mr. Chatfeild Clarke had been unable to prepare a paper, he was very glad to see him in the room, and he should at once call upon him to speak to the subject.

Mr. Chatfeild Clarke, F.R.I.B.A., and a member of the London School Board, expressed his great thanks to Mr. Robson for kindly consenting to prepare and read a paper on this subject. With regard to many of the questions raised by Mr. Roger Smith, there was a great deal to be said. Taking the question of conveniences first, he thought it would be a mistake in a modern school not to put a covered way to those conveniences, though it should be open to the air on one side. As to the principle of teaching in distinct class-rooms, and of its great value both for discipline and study, he thought highly of it, and he went down to Scotland last year to see some of the large Scotch schools thus worked, and he trusted Canon Cromwell was more than half a convert to the success of such a system. The principle pursued in Scotland, and which was carried on in buildings by no means new, and which in many cases were adapted only, consisted in having a large central corridor, open at the ends. The rooms opened directly into this corridor, and were ventilated by end windows on each story, by openings over the doors, and by "well-holes" passing through the floors from basement to roof. This means of ventilation was found to be most effective. The class-rooms were constructed to take 54 scholars each, but as it was found that the percentage of absentees was 4, the class generally consisted of but 50 children. Each of these class-rooms was, in fact, a separate school. He was glad to say that that plan was about to be carried out for the London School Board by Mr. Roger Smith in one of the first schools the Board were going to build. In one of the schools he had described the head master did not teach at all, and there was no large central room. The master had an office in which he entered the children, saw the Committee, and received the returns of absentees, and he superintended the whole of the teaching in the school, which had 1,200 or 1,400 children attending it. The whole of the work of the school went on with the greatest quietude and order. Each child knew his own class-room, and was under the same teacher for months. This was a great advantage, as it was very important that teachers should thoroughly understand their scholars. In the school to which he was referring there was a dullards' class, where those boys and girls who were naturally very backward or dull were put under the care of a mistress specially capable of helping along dunces. He and many others who had thought upon the question were most strongly of opinion that the most efficient way of teaching was in classes, and the head master of the school referred to, in answer to the question "Would you return to the old system of teaching—that is, to have one general school-room and a few class-rooms?" said "By no means; I believe that we should lose all the advantages we have gained, not only in discipline but in the power of teaching, and in the knowledge of each distinctive child." A moot point in designing schools in this country was whether the benches in the class-rooms should rise one above another. In many of the Scotch schools referred to this was done, and it was in buildings so arranged that the Scotch had solved the problem of giving girls a good middle-class education. In the school he had more particularly described all the arrangements were admirable. No girl went up the same staircase as she came down by: there were separate upward and downward staircases to avoid confusion. Every division of the school apparatus was kept under lock and key, including the bonnet and cloak-rooms, and it was the duty of the mistress to accompany the children to these rooms to get their bonnets. In all such schools there were spare rooms capable of containing 120 or more children, sometimes in two classes, sometimes in one, for singing, drawing, or matters of that kind. As to ventilation, he thought that many of the architects who had taken part in the recent competitions had failed to succeed because they had failed to make any provision for cross ventilation. It was the decided opinion of all who were practically acquainted with the matter that thorough cross ventilation must be secured if the health of the children was to be considered. In some of the best Birkbeck schools which he had visited, ventilation was secured by skylights. The roofs were open, and the class-rooms were placed side by side. This effected a considerable saving of space, but he did not think that the ventilation could be so complete as by windows on each side of a room. In the German schools the heating was generally accomplished by a stove in the basement, the hot air being delivered into the room, and the foul air extracted by shafts. The rooms contained about 60 children each. In the Middle Class Schools in Cowper-street, City-road, there were facilities for the boys to dine. If some such arrangements could be made in connection with schools generally, he thought it would be advantageous, as it would both save time and save the children from a good deal of exposure to inclement weather. He concluded by expressing his indebtedness to Mr. Robson in preparing and reading the paper.

Mr. James Watson, another member of the London School Board, said he would like to contribute one suggestion to the discussion. He had been for many years a member of the weekly board of one of our largest metropolitan hospitals, where the louvre system of window openings had been thoroughly tried, and had been found to be perfectly successful. He referred to the Middlesex Hospital, and the system had since been tried with the same success in a new hospital in Soho-square. There were four louvres in each window, and they had been tested again and again with lighted candles to see whether there was any downward draught, and it had been found that the fresh air passed over the heads of the patients to the centre of the room, and became somewhat warmed before descending. He had been educated in one of the Scotch schools described by Mr. Chatfeild Clarke, and he was quite certain that the School Board would not be doing its duty unless it gave those schools a perfect trial. He was no convert to the German system.

Mr. Lacy W. Ridge, A.R.I.B.A., proposed a vote of thanks to Mr. Robson for his paper, and to the three members of the London School Board who had taken part in the interesting discussion. As to the louvre lights referred to by Mr. Watson, he was of opinion that the windows hung on a transom and dropping inwards, as described by Canon Cromwell, answered all the purposes of louvre lights, and prevented the possibility of a down draught. Windows of this kind were not at all uncommon, and had been proposed for many of the new schools about to be erected. He could fully bear out what had been said by Canon Cromwell as to being able to keep these windows open nearly all the year. He also thought it very necessary that there should be windows on both sides of the room, or at all events at one side and one end, in order that when the children were out of the room there might be a thorough blow through, and with this end in view he did not think architects could do better than make their windows with the old-fashioned double-hung sashes. He found that every sort of casement fastening proved a failure after a time, but double-hung sashes very seldom came to grief. The two systems of schools which were before the meeting might be called the general school system and the class-room system. It was no very difficult matter to plan a school on either of these systems, but the problem set for those who had to erect schools in this country was much more difficult. The School Board was thoroughly alive to the importance of having every child taught in class, and class-rooms had therefore to be provided; but on the other hand, inasmuch as these schools were only day schools, and it was desirable to bring the children together on certain occasions, architects had to combine some of the class-rooms in such a manner that they might form together, when necessary, a general room for the whole of the school. How to solve this problem without a waste of space was the question. As to sliding screens or partitions, he thought that those to be seen at the Home and Colonial Schools in Gray's Inn-road very fairly met their requirements.

Mr. J. Douglass Mathews, A.R.I.B.A., in seconding the proposition, said it was always a most difficult thing for an architect to understand clearly what his clients really wanted, and he was quite sure that in the competitions which had recently taken place for schools for the London School Board architects did not know exactly what was wanted. He thought that the information which had been given that evening would be of great service in future competitions. Besides the general requirements of a school, there were a great many important and special matters of detail to be borne in mind by the architect when making his plans. The matters of detail could, of course, be left to the architect to settle, but as the schools were to be built to last for a considerable time, and at a considerable expense, such details required more than ordinarily careful attention. As to the important subject of lighting and ventilation, there was such diversity of opinion that he thought the School Board would not be going out of its way in instituting a commission of inquiry into the subject. This would relieve architects of a great deal of doubt and difficulty.

Mr. **Riddett** asked Mr. Robson whether the London School Board felt inclined to adhere to the notion that the sliding partitions should be double? He had carefully inspected the partitions at the Home and Colonial Schools, and they seemed to answer their purpose uncommonly well, although they were only single partitions. As to cross ventilation, he had had a good deal to do as an assistant with the London Fever Hospital, and Dr. Buchanan, who was regarded as an authority on the matter, strongly insisted on cross ventilation in all the wards and rooms.

The **President** regretted that they had not more time for the further discussion of the subject, but hoped that it would be resumed on some future occasion. As to the remarks that had fallen from Mr. Mathews with regard to the difficulties which architects experienced in getting to know exactly what their clients wanted, he had always maintained that, although architects ought always to feel obliged for any information given to them by those who had made a special study of certain subjects, it was for architects to make their buildings as perfect as possible by their own work and research. He should like to hear more explicitly whether a large general room was likely to be demanded in the majority of the schools built by the School Boards. He then put the proposition to the meeting, and it having been carried unanimously,

Canon **Cromwell**, in reply, said that with regard to through ventilation, he thought it could be well effected in a long room by opening the windows at either end, and he did not think that cross ventilation was absolutely essential in schools, although it was in hospitals, where much more air was required than in school-rooms, inasmuch as the patients generally slept in the wards which they occupied by day. As to water-closets, his experience was distinctly in favour of having them quite distinct from the school buildings. As to heating and ventilation, he read a few years ago a work by General Morin, describing the principle adopted in Paris under the *régime* of the Emperor and Baron Haussmann for warming public buildings. The principle employed was essentially that of Galton's system, and was found to work very satisfactorily, the fire in the basement serving to warm all the rooms to the top of the building. As to raised platforms, as in the Scotch system, there was no doubt that they were of great advantage if there were more than four desks in a block. In the Zurich schools he had seen the platforms were not raised, although they were at Strasburg. In American schools the classes were usually arranged on the flat. As to the provision of a large general room or hall, he was of opinion that such a feature was of very little practical use. It was very interesting, no doubt, to be able to get all the children together on certain occasions, such as the distribution of prizes, &c., but in the case of the schools to be built by the London School Board he should suggest that the infants' schools should be made to serve for such purposes. The subject of infants' schools had hardly been touched upon at all on that occasion, but the experience of all concurred in saying that an infants' school should be a large room. The infants' school, then, should become the large room of the graded school, because it would generally be unused by the infants when wanted for any special purpose.

Mr. **Chatfeild Clarke** said that however clear their clients might wish to make the instructions to architects, a great deal must necessarily be left to the talent and skill of the individual architect in composing his plan, and the more that was left to him in that way, the better. (Hear, hear.) The School Board wished to get the very best plan with the least possible cost.

Mr. **Robson**, in reply, said he was glad to see that at the meetings of the Association prominence was given to the discussion rather than to the paper; he wished it was so at the Institute. Canon Cromwell had answered nearly all the questions that had been raised in the discussion, but he (the speaker) thought that if the French had beaten the Germans in the late war we should have heard far less of German schools than we had of late. The plan of having a number of second-rate teachers, superintended by the head master, which was a necessity of the German system, did not find favour in this country. Rightly or wrongly, the School Boards were all under the control of the Education Department, and one of the first principles that Department laid down was that no one master or mistress should be walking about merely as a superintendent, but must take an active part in teaching. One of the weak points in all English schools had been the want of class-rooms, and this hed been caused by want of funds, and in his opinion, if we took the German idea of more class-rooms, and added it on to our English system, we should obtain schools which would best meet our requirements. He did not think that in a long room opening the windows at each end would effectually and quickly renew the air of the room, as it would depend very much on the axis of the room in relation to prevailing winds. He thought that cross ventilation was decidedly the best, and if such a mode of ventilation was, as Canon Cromwell admitted, the best for hospitals, it must necessarily be the best for schools, for in both cases it was impossible to have too much fresh air. As to partitions, he thought it desirable that they should be double, as he had never seen a single partition that thoroughly answered its purpose.

Mr. **Thos. Blashill** said that as that was the last night of the Session, in accordance with usual custom he begged to propose a vote of thanks to Mr. Plumbe for the able and assiduous manner in which he had fulfilled the duties of his office during the past year. Mr. Riddett seconded the proposition, which, having been carried, was acknowledged by the President, and thus terminated the meetings of the Association for the present Session.

ILFRACOMBE.

Few towns are more romantically situated than Ilfracombe (Ilford's Combe or Valley), and few places in Europe have more health-giving properties to offer to the jaded and wearied visitor than Ilfracombe can afford. We admit a stronger affection for Llandudno, with its glorious headland, than, perhaps, any sea-side resort we know, but after that Ilfracombe runs a close second, and to all who love magnificent coast scenery, a charming sea, and some of the grandest drives an Englishman can boast of, this North Devon watering-place offers uncommon attractions. The population is not more than about 4,000, and the town, on the main, consists of one long street running down a tolerable declivity, from the church to the harbour, for about a mile. Some of the shops are fair, but the best houses, of course, are to be found upon the terraces and slopes, by which the town is surrounded as by the sides of a basin. The principal promenade is the Capstone Hill Parade, one of the finest seaside walks in the kingdom, cut along the side of the sea-washed hill of that name; and plentifully supplied with seats and music. Trade is brisk in Ilfracombe just now. The new pier is progressing satisfactorily, and many new villas, some of no little architectural pretensions, are springing up on all sides, and in the High-street a new row of shops, and some other additions, are being built, which will be decided improvements when finished. A new villa, just built for Mr. Wivell, upon the Torrs, from the designs of Mr. W. C. Oliver, architect, of Barnstaple, of recent works is, perhaps, the most worthy—in design and plan as well as internal arrangement—of notice. The materials used in the construction are Bridgwater bricks of various hues, with dressings of Bath stone. The sky line is well managed, and comes out picturesquely against the high tors and wild scenery in the immediate neighbourhood, whilst a sprinkling of very fair carving and some tile decoration in the tympanums add a lightness and richness to the whole work. Internally the hall is laid with encaustic tiles, and the staircase, which is somewhat ornamental, is of pitch pine. The builder is Mr. J. Tremear, of Bideford, the tiles are Maw's, and the carving by Harry Hems. Altogether this is a charming villa in a still more charming locality. At the other end of the town, in what is termed Quay-fields, a large house has just been built for Mr. Camp, from the designs of Mr. Huxtable, architect, Mr. Norman, of Ilfracombe, being the builder. It is of considerable merit in many respects, but an arcaded terrace, standing upon Bath stone columns and carved capitals, carrying upon very flat arches a slate landing, which runs around the basement of the villa upon the sea-view side, is so slight that we hope it will not come down quicker than it went up. Should there, at any time, be a number of persons collected upon it this will probably happen. Close by a row of lodging houses has been built, or rather "run up," so slightly, indeed, that we were assured by the intelligent coachman whose box we shared in the picturesque drive of some dozen miles to the railway station that "he could see daylight through them" before the plastering—"slap-dashing" he called it—was done. We fear too little attention is paid just now at Ilfracombe—as, alas! elsewhere—to the all important item of stability, a quality much needed in buildings on a rough coast with a north-western aspect, which cannot fail to be much exposed in winter. The Royal Hotel has had an additional wing put to it, not altogether in harmony with the rest of the building. The parish church of Holy Trinity is to have some additions, and a new chancel screen is now in progress. The building is Perpendicular, the font Norman. It is proposed to build a new Forester's Hall in Oxford-street; the design is out, and is Gothic; materials, brick with Bath stone dressings. Bath stone seems latterly to have been much used in Ilfracombe, more so of late than ever it was before. So long as Combe Down and Box-ground are used, and the "beds" attended to, it may be used with perfect confidence; but we do not feel so sure of Corsham Down or Farleigh, and question whether the air will not be found too strong for it. J. V.

BOOKS RECEIVED.

The Strains in Trusses Computed by means of Diagrams, by F. A. Ranken, M.A., C.E. (London: Longmans, Green & Co.), is a clear and comprehensive statement of the theory and method of computing by diagrams the strains in trusses bearing a constant load without taking into consideration the subject of transverse strain. The author has treated only balancing systems of forces in one plane, each system acting on a point, purposely avoiding the introduction of the principle of moments, wishing to confine himself to the results to be deduced from the parallelogram of forces.—*New Formulas for the Loads and Deflections of Solid Beams and Girders*, by William Donaldson, M.A., A.I.C.E. (London: E. & F. N. Spon), contains an attempt to obtain a set of formulas for the loads and deflections of solid beams *strictly* based on the assumption *ut tensio sic vis.* Mr. Donaldson's conclusions are somewhat novel, and deserve the attention of engineers.—*Iron as a Material of Construction*, by William Pole, F.R.S. (London: E. & F. N. Spon), is the substance of a valuable course of lectures delivered at the Royal School of Naval Architecture, South Kensington, by the author. The work is necessarily principally a compilation, but the arrangement of the work is very simple and convenient, and its general authority is supported by a practical experience of forty years in the subjects of which Mr. Pole treats.—*Patterns for Turning, without the use of any Ornamental Chuck*, by H. W. Elphinstone (London, John Murray), contains exactly what its title indicates, and will, doubtless, be welcomed by devotees of the lathe.—*The Hygiene of Air and Water*, by William Procter, M.D., F.C.S., is a popular statement of the injuries produced on health by impure air and water, indicating the origin of their impurities, and the means of detection and removal.—*Practical Plane Geometry* (No. 178 *Weale's Series*), by J. F. Heather, M.A. (London: Lockwood & Co.), is intended to supply a course of practical plane geometry, as shall enable candidates perfectly to master the constructions given in the papers for competitive examinations on this subject, and to form a complete introduction to intended succeeding volumes on "Projection and Descriptive Geometry."—*Handbook to the Prince Consort Memorial* (London: John Murray) is published by authority of the Executive Committee, and is a complete little guide to the great memorial. It contains two good illustrations—one of the memorial, the other of the statue to be enthroned therein.—*Practical Suggestions to all Inventors and Patentees and Purchasers of Patents*, by Julius Hall, is very much like similarly titled works. If inventors take a tenth part of the good advice so freely tendered, we admire their capacity.

The foundation stone of a new National School at Fletching, Sussex, was laid on Tuesday the 2nd instant by the Countess of Sheffield. Mr. Edward Francis Clarke, of London, is the architect, and Mr. James Peerless, of Eastbourne, the builder.

Since Lady-day last there has been an increase in the several classes constituting the Institution of Civil Engineers, taking into consideration the deceases, resignations, and erasures, of 2 honorary members, 11 members, 36 associates, and 9 students, showing an effective increase of 58, and bringing up the numbers of the several classes to 16, 756, 1127, and 243 respectively, making together a total of 2142 of all classes.

ALL SAINTS' CHURCH, EDINGTON, WILTSHIRE.

WE are enabled to give this week the two drawings for which the author, Mr. F. C. Deschon, received the Institute prize—the silver medal of merit—on the 10th ult. The President, in presenting Mr. Deschon with the medal, said the drawing illustrated one of the finest churches in England.

The following account has been sent us by Mr. Deschon:—William de Edyndon, Bishop of Winchester, built at his own expense a new church at this, his native place, about A.D. 1347; and therein founded, in honour of the Virgin Mary, S. Katherine and All Saints, a large chantry or college of a dean and twelve ministers, whereof part were prebendaries. At the desire of the Black Prince reformed Friars of the order of S. Austin, called Bonhommes, were settled here, in their place, under the government of a rector, in 1358. Edington Church was dedicated by Robert Weyvill, Bishop of Sarum, in honour of S. James the Apostle, S. Katherine and All Saints, A.D. 1361. William de Edyndon died in 1366, having been made Chancellor of England in 1357.

The church is cruciform, and the rood screen which projects west of the chancel arch under the tower is still surmounted by the rood loft, or gallery, but into this there is no means of access unless by ladder, neither is there aught to show how it was formerly entered. The parvise over the south porch has two stories. The cloisters which ran outside the north aisle wall are completely gone, and in the beginning of this century their place was occupied by farm stables. At the west end of this north aisle wall is the mark of a doorway; this was opened some years ago, and inside was found a small chamber in the wall (which here projects some 3ft. inside the church), neither large enough for a man to stand or lie in, and it has been supposed that this was formerly used to immure refractory monks.

The main dimensions of the church are as follows:—Total length inside, 153ft. 9in.; total length outside, 168ft. 6in.; total width inside, 71ft. 10in.; total width outside, 86ft. 10in.; height of tower from nave floor at west end, 67ft. 6in. In "Domesday Book," Edendone, as the name is there spelt, is entered as held by the Church of S. Mary, Romsey.

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CHANCEL ORGANS.

WE illustrate two organs exhibited by Messrs. Bevington & Sons in the International Exhibition. No. 1 is built on a new design for chancel or gallery of church, and is in a handsome Gothic screen case of pine, stained and varnished, 7ft. wide, 4ft. deep, and 15ft. high. No. 2 is a self-supporting bracket organ, the bellows and pipes being above the performer, so that the organist and bellows-blower are included in the space which an ordinary instrument would take—a most desirable contrivance where the chancel is narrow. The screen case is 7ft. wide, 17ft. high to top of centre pipe, and projects 4ft. from the wall. Long experience has enabled Messrs. Bevington & Son to produce these instruments at a cost which, taking into consideration the good workmanship and artistic construction combined in them, is very moderate.

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SCIENCE AND ART DEPARTMENT.

THE examination of students' works submitted from night classes for drawing, and from schools of art in competition for payments and prizes, has just been concluded. From 397 night classes 56,016 works have been received. From 114 schools of art 73,226 works have been sent up, making a grand total of 129,242 drawings, models, or paintings, which have been executed in the classes during the year ending in April last. This is an increase over 1871 of 19,051 works. These works were first submitted to a preliminary examination, each school being taken separately, by a committee of examiners, who awarded 1,100 third-grade prizes, and at the same time selected from the mass 1,208 of the best and most advanced works for reference to the national competition in which all the schools of art in the country compete with one another.

Ten gold, twenty-five silver, and sixty bronze medals have been awarded, together with a number of prizes of books.

The prize works of this competition, together with as many of the other competing works as space could be found for, are now exhibited in the western gallery on the ground floor of the South Kensington Museum, where they will remain open to the inspection of persons interested in art education, and the public, until September.

THE CITY COMPANIES AND TECHNICAL EDUCATION.

ONE by one the great guilds of the City of London are coming forward and doing something practical in the way of promoting technical education and a knowledge of the handicrafts with which they are more or less connected otherwise than by name. We believe that the Painter-Stainers' Company, under the Mastership of Mr. John Sewell, had the honour of taking the initiative in this laudable work by offering prizes for the best specimens of staining, graining, and other decorative work. The Turners' Company, the Goldsmiths' Company, the Plasterers' Company, and, if we mistake not, one or two other of the old City Companies, have followed the example thus set, and we hear that the Saddlers' Company will shortly follow suit. This is as it should be, not only for the welfare of industrial art, but for the sake of the guilds themselves. It has been said times out of number that unless these guilds do all in their power to promote technical education, especially in the trades with which they are at least nominally identified, they have no *raison d'etre* in the present utilitarian age. Many, if not the majority of these guilds, are possessed of great wealth, and how can they better employ their means than by doing what a few of their number have already done? We are constantly being reminded that in many branches of industrial art the ground is being cut from under our feet by foreign competition—competition, too, not only in cheapness, but in skilled workmanship, and this in some of those departments of labour in which we have hitherto flattered ourselves that we could not be rivalled, much less beaten. The London guilds, then, in the interests of the trade of London and of the industries of the country at large, should use every means in their power to promote technical education. By so doing, they will not only promote the good of the community, but they will save themselves from dying of effete old age, or from being swept away by the tide of progress.

The Plasterers' Company this year offered the undermentioned prizes to be competed for by students in metropolitan and provincial schools of art in connection with the Science and Art Department, South Kensington:—I.—A model in plaster. An original design for a portion of a frieze suitable for use in interior decoration. For the best, £7 7s.; second best, £4. The winners were E. Wormleighton, Central School of Art, South Kensington, 1; G. H. Daymond, Westminster School of Art, 2. II.—A design in monochrome, drawn in pencil or in monochrome, and capable of being executed in plaster, in low relief, for the decoration of the end of a room. For the best, £8 8s., second best, £5 5s. Winners, Oliver Morriss, South Kensington, 1; Joseph Parr, Burslem, 2. The prize works were exhibited to the Court of the Company the other day at its quarterly meeting, and were considered to be very meritorious, and they will be exhibited with the national works at South Kensington. The Court has it in contemplation, with a view to extend the usefulness of their works, to have copies or casts of the first prize for modelling, in each year, taken in sufficient number to present a copy to each of the metropolitan schools of art, to the City of London, the Architectural, the South Kensington, and the East London Museums. It is also proposed that photographs shall be taken of the first prize for design, and that copies shall be presented in like manner. By these means the opportunity of studying the works will be offered to a large number of young people attending the schools, and publicity will be given to them which cannot be afforded at present, as they are only exhibited at South Kensington, and that for a short time.

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The oldest artesian well in Europe is said to be at Lillers, in the Pas de Calais, and from its mouth water has flowed uninterruptedly for 746 years.

A new Wesleyan Chapel and Schools are erecting at Wheelock. The style is Gothic, the cost £1,730, the architect Mr. Geo. B. Ford, of Burslem, and the builder Mr. W. Martin, of Haslington.

THE POST-OFFICE AND THE PRESS.

READERS of the BUILDING NEWS receiving their copies direct from the office were last week surcharged by the Post-office one penny on each copy. Many of them communicated with us, and we at once set about to discover the cause, knowing that the reason inscribed on each paper "above 2oz." could be but a shuffling pretext for the indulgence on the part of the Post-office officials of an amiable feeling entertained towards ourselves, and which one of them recently personally assured us should be manifested when the next "half chance" presented itself. We wrote to the secretary on Monday, but not feeling inclined to wait the customary fortnight, sought a personal interview with that august functionary yesterday. We were received by a "heavy" specimen of the Government clerk style, by whom spectacles and an enormous development of shirt wristband are evidently counted as indispensable adjuncts to secretarial dignity. Hard work appeared to have somewhat affected this individual's mind, for we heard him confess to a fellow clerk his inability to state what day of the month next Monday would be, and only by a considerable effort managed to remember yesterday's date, furnished with which preliminary information the inquiring clerk proceeded to enter upon the difficult calculation necessary. We took courage to make our inquiry, and at last ascertained that we had transgressed a rule of the Post-office by not affixing the date and title to one page of our last number. That page, as our readers know, begins our half-yearly volume, and it is our custom to begin the matter lower down than usual, and not to head the page with rule, date, and title. The same thing was done by one architectural and one engineering contemporary, and one of them, so far as the publisher knows, has not been similarly served, so that we have additional reason for believing that a special mark of favour has been conferred on the BUILDING NEWS. We are expected to spoil the appearance of the first page of our volume to serve no useful purpose whatever! If the Post-office is to be permitted by arbitrary acts like this to hinder the business and *damage the circulation* by offending the subscribers of newspapers, the sooner some united action is taken the better. Cannot Mr. W. H. Smith bring the matter forward in the House of Commons before Parliament separates? He is almost as much the representative of the newspaper interest as of Westminster, and no one could do it better. Meanwhile, we ask every contemporary to re-echo our complaint, and we will, whenever occasion offers, return the compliment.

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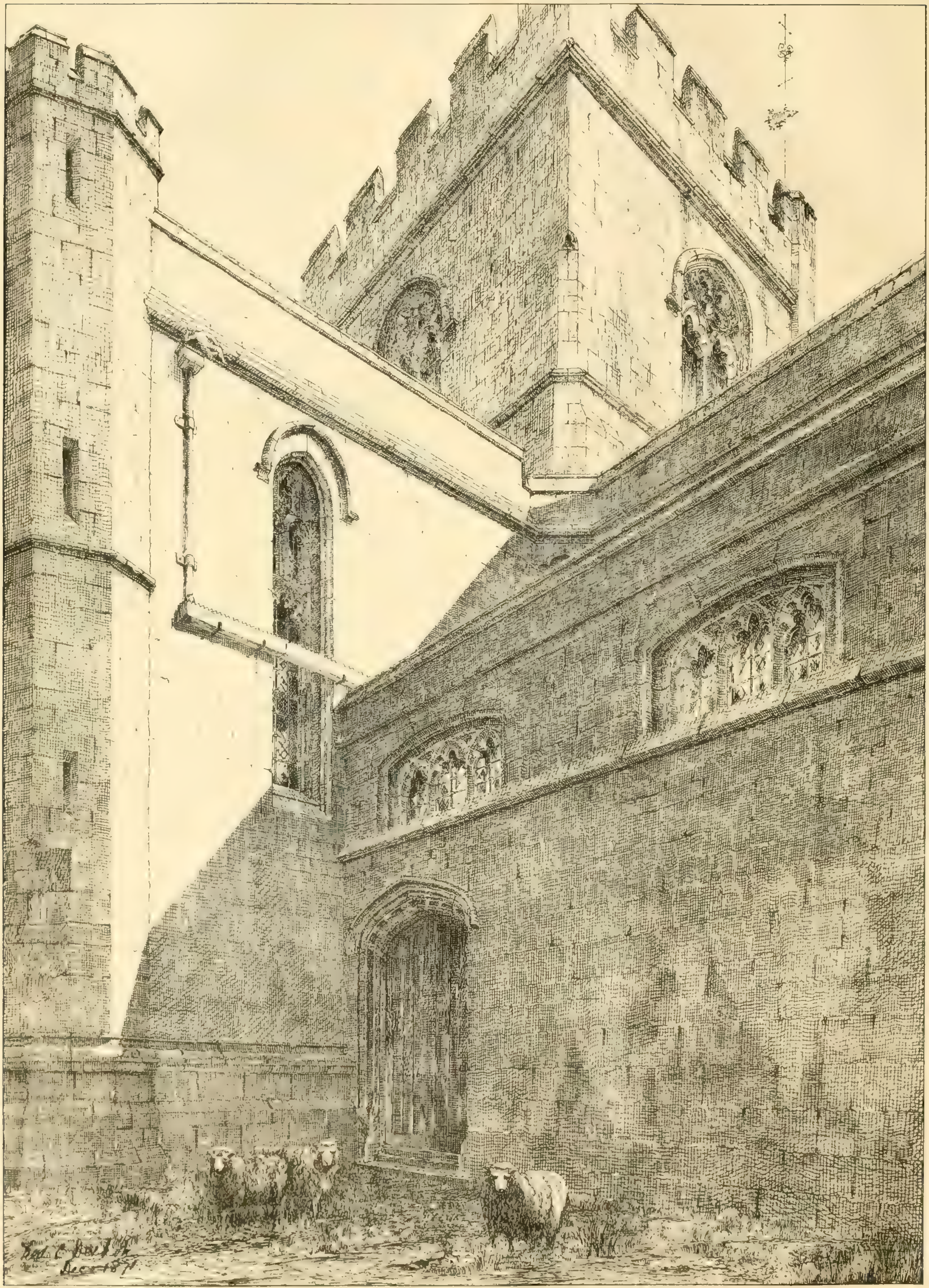
RIBAND POSTS AND PILLARS.

THE enormous increase in the price of iron within the past few months has rendered it a matter of absolute necessity that some method should be discovered of using it more economically in construction. The Riband posts and pillars, manufactured under Lee & Rogers' patent by the Riband Telegraph Post Company, of New Islington, Manchester, will, we think, be very readily adopted by architects and builders. The pillars are constructed of wrought iron, and are intended to replace the cast-iron columns at present in use. From an art point of view this is a step in the right direction, the metal being treated *as* a metal, and not in false and untrustworthy imitation of other materials. Other very great advantages are gained by the invention: for instance, a pillar 10ft. or 12ft. high, and 8in. diameter, weighing only from 130lb. to 140lb., has been tested to carry from one to two tons vertically, and can be supplied complete with cast-iron capital and base at 4s. per running foot. Compared with a cast-iron column the riband pillar is little more than one-third either in weight or cost of the former. The pillars are adapted for carrying roofs of sheds, railway-stations, verandahs, balconies, &c., while for horticultural buildings their light and ornamental appearance render them especially suitable. They can, moreover, be firmly fixed in two feet of ground, whereas a cast-iron column generally requires the excavation of four feet of earth. For telegraph posts the special advantage is claimed that by their adoption "weather faults" are altogether prevented. With the present timber posts the difficulty of always insuring perfect contact of the earth wires with "good earth" is well known; in the case of the riband post its direct contact with the arm and the large metallic surface it presents form the most perfect "earth" possible.

Some designs for lamp-posts, forwarded to us by the company, are very pleasing, and we should be glad to see them substituted for some of the mis-shapen cast-iron posts that now disfigure and encumber our streets. Examples of the pillars will, we are informed, be on view at the Cardiff Agricultural Show; readers who may visit it should look out for them.

THE BUILDING NEWS JULY 12th 1872.



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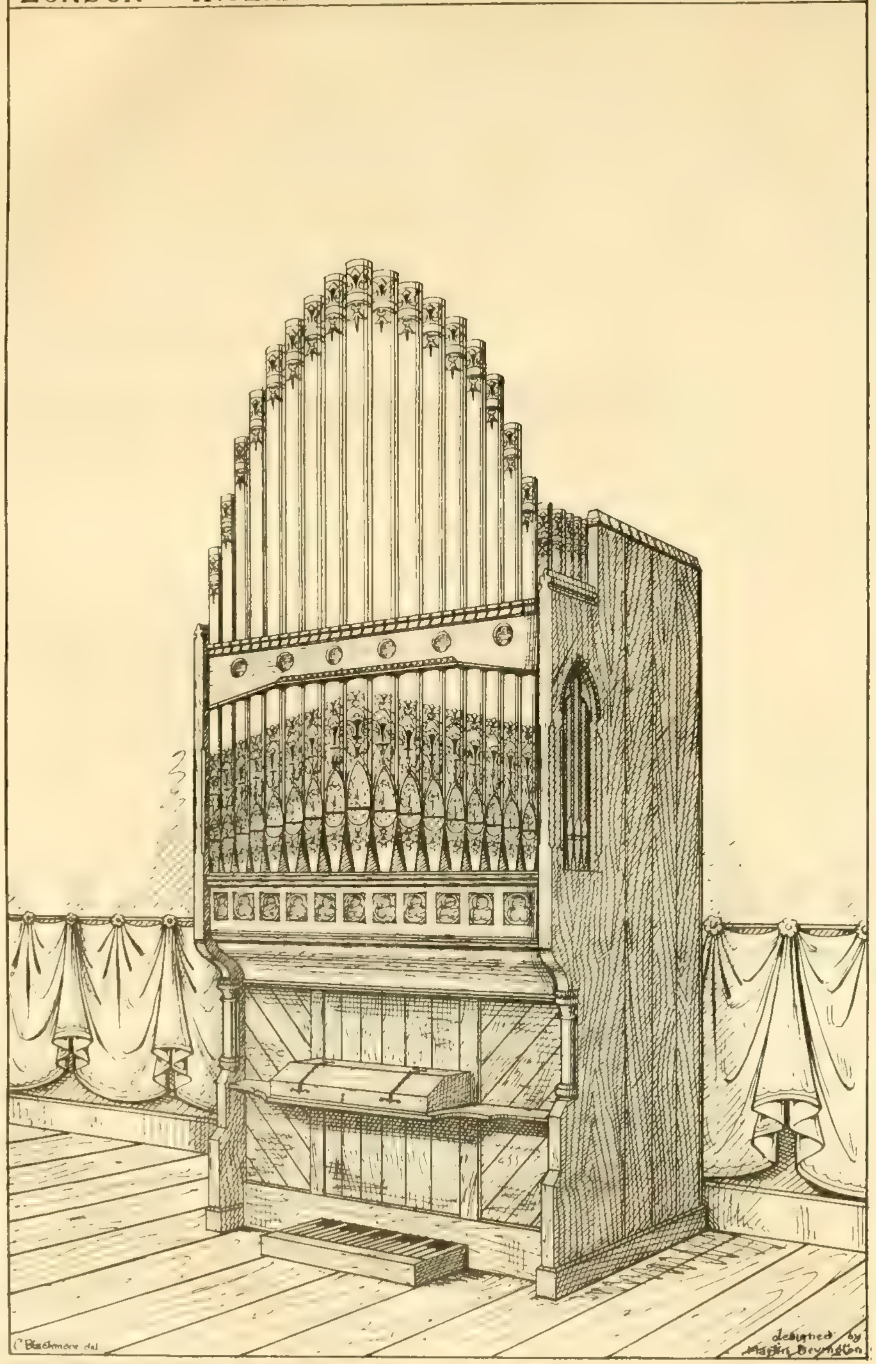
ALL SAINTS' CHURCH _ EDINGTON _ WILTSHIRE.

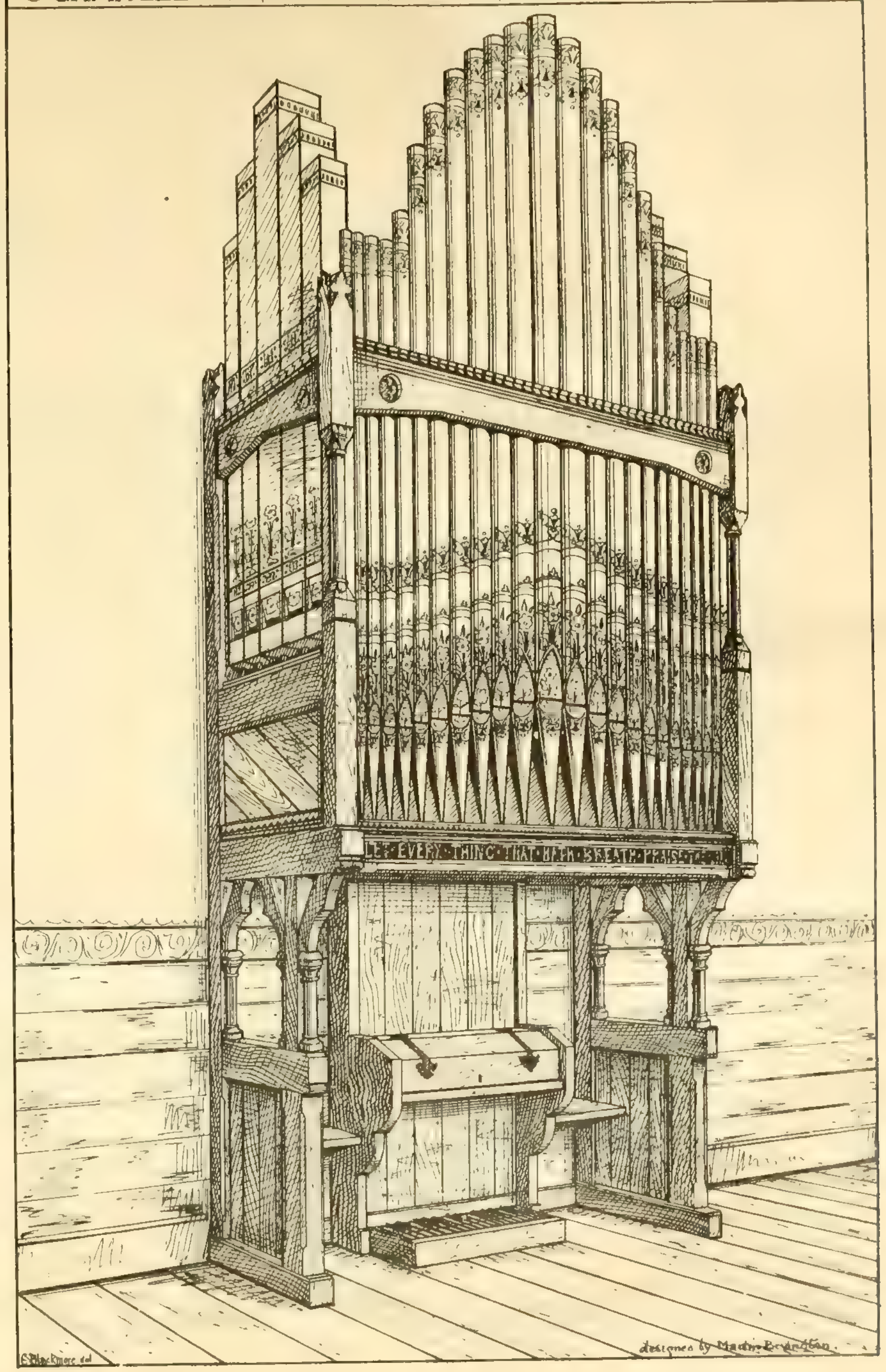
ANGLE OF NORTH TRANSEPT AND NAVE.

THE BUILDING NEWS JULY 12th 1872.

LONDON · INTERNATIONAL EXHIBITION · COURT · 13



CHANCEL ORGANS · BEVINGTON & SONS · SOHO ·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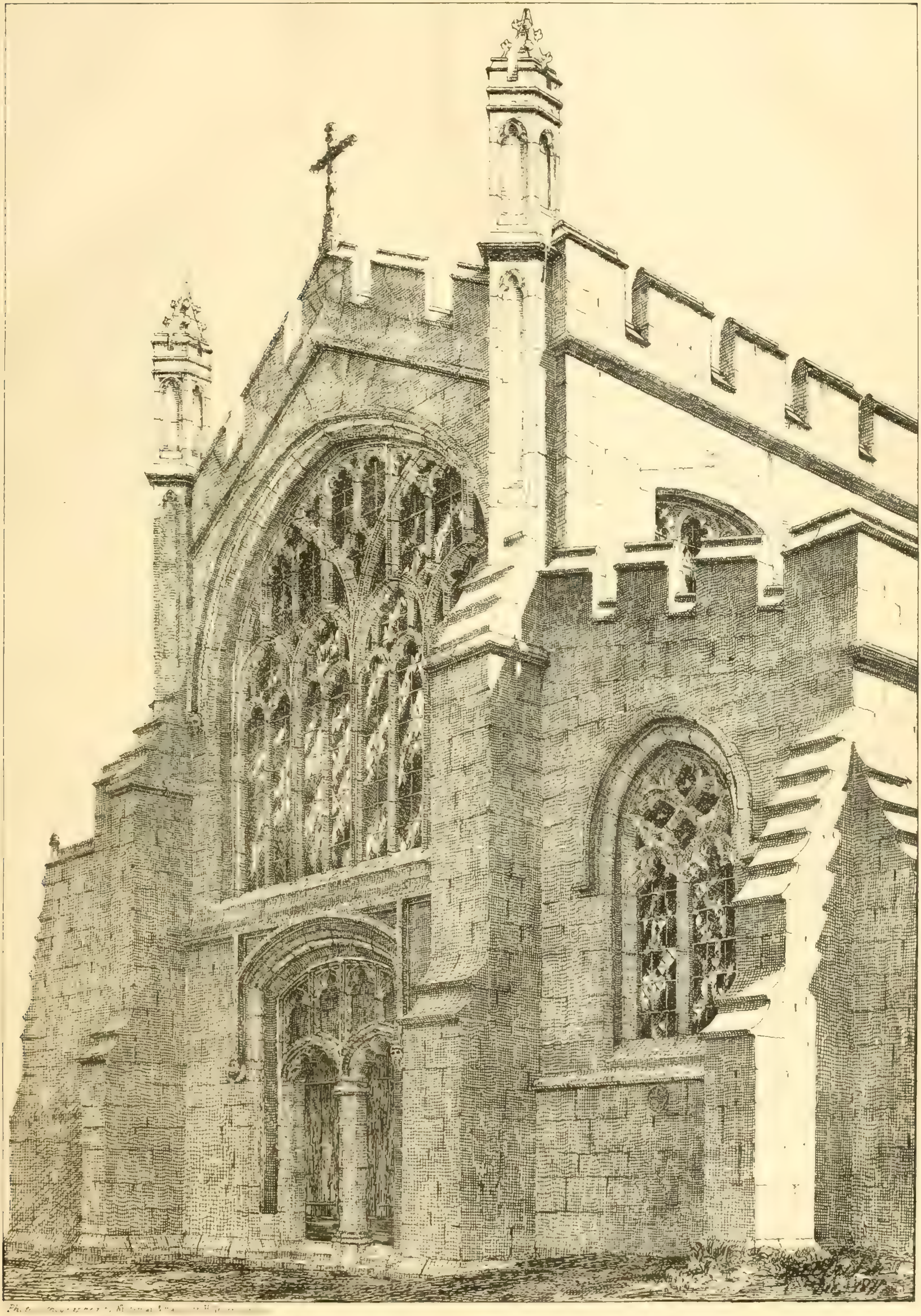

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ALL SAINTS' CHURCH _ EDINGTON _ WILTSHIRE.

WEST FRONT.

SPURIOUS ECLECTICISM.

THE daw that donned the fine plumes he had borrowed, or, perhaps, in plainer English, it might be said stolen, no doubt dubbed himself eclectic, if not original. Nevertheless, for all that, the jays, remorseless critics, plucked each feather from him, and justly sent him forth to consort with his own dusky tribe. Would that many of those architects whom the public, credulous and ignorant, delight to honour, were similarly treated. If the ghosts of the Greeks whose name they take in vain could avenge themselves, it would not be long before some such act of righteous vengeance brought consternation into the smiling and self-congratulatory assemblies in Conduit-street. Even poor Palladio, who had much to answer for himself, but has doubtless by this expiated his comparatively mild peccadilloes, would be roused beyond endurance if he knew of the enormities perpetrated by those who pretend to rank themselves as his followers. The hash that the genuine Italians made of Classic details after all was a savoury one, and if somewhat viciously overspiced, had solid nutriment within; but the versions now served up to us are all curry without either flesh or rice, and we are forced to confess that they upset us. When a structure has dignity and good proportion, we may condone some misappropriation of the orders in what are, after all, but mere trappings which it could afford to dispense with altogether. But strip the modern works of those that affect this school, and what should we have left? It is these trappings that we object to, and the persistence in employing them which astonishes us. Against Classic or Italian architecture *per se* we have not any cause of complaint; we may and do personally prefer Gothic. We may and do think it impossible to adapt the Greek style to our climate and wants, and even that which was developed for the special use of the sunny land of Italy we may think it difficult to translate into English, and certainly decline to undertake the task ourselves, but feel we have no ground for quarrelling on this score with those who are inclined to be more venturesome. All styles are wondrously elastic, and, like oral languages, each is capable of being the vehicle expressing the thoughts of those who have any thoughts worth description. But the fantastic misuse of columns, and building up of entablatures to give the former some sham appearance of utility, the muddling up of Greek and Roman precedents, with an occasional bit cribbed from Egyptian or Moorish examples, is not eclectic. The sticking up on the angles of buildings empty vases which are a sort of cross between a flower-pot and an obelisk is not eclectic. Neither can the frantic efforts made by some to graft a few Mediæval details upon Italian forms claim that euphonious name. Stopped chamfers round the edges of openings consort ill with pediments and consoles. French thirteenth century conventional foliage looks ridiculous crammed into panels surrounded with bolection mouldings. Of *rechauffes*, of even Elizabethan architecture, and certainly of the Queen Anne style, lately come into fashion, we have had more than enough; and though we can look with interest upon the genuine works of those periods in our history, mainly as forming landmarks in that history, their hybrid jumbles of detail are not sufficiently eclectic in any good sense to deserve imitation at our hands. We grieve, therefore, to see coming from a firm of architects, Messrs. Slater & Carpenter, who base their reputation upon their works in the pure Gothic style, such a building as that of Holdenby House, illustrated in the last number of this journal, with mullions and transoms pretending to carry us back to the days of the Tudors, with a porch built up with pilasters one above another like acrobats performing in a circus; dormers with pediments, like pork-pie hats flattened down upon towers of back hair, such as damsels of the present day delight to erect, and chimneys with chamfered plinths and octagonal bases, but tops that look like slabs substituted by country masons for the proper appropriate capitals that some high wind must have decapitated. Eclecticism! Eclecticism! What horrors have not ere this been perpetrated in thy euphonious name!

J. P. S.

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MODERN ARCHITECTS AND THEIR WORKS.—II.

NEXT to the Palladian group of architects we find what Mr. Kerr calls the "Elizabethan-style-revived" group. It is *par excellence* a country house set, and, being so, its edges are not so sharply defined as are those of other groups, for on one side they are overlapped by the mild Palladian, and on the other by the uncertain Goth. Elizabethan-revived country houses are mostly gentle looking things, without much character either bad or good—a cossetty kind of architecture, with little or no back-bone in it, and quite too inoffensive to rouse much adverse criticism. There is about it a simple restful spirit of repetition. Not merely do we recognise the same handwriting and the same thoughts, but we have over and over again the same phrases and sentences, occasionally, even, whole verses. In plain architectural words, the detail drawings of (say) an Essex House, built in 1860, appear to have been found convenient for a dozen others in as many different counties. The plan is usually a long one, that is to say, all front and back and no ends or sides. The materials are generally red brick, with white wrought-stone dressings; the latter so much admired that they are even applied to the angles of the walls. There are square and semi-octagonal bay windows in all the enjoyment of plenitude, and now and then an angular or circular oriel peeping out in a timid shrinking fearful sort of way, as if there was something not quite right in the liberty it was taking with the delicate wall it overhangs, and making up for its timidity by a more than usual boldness in its corbel mouldings. The gables have nearly always considerable difficulty in keeping quite straight, for the Elizabethan-revived architects have a notion that the notched and curved lines of some old examples, if not characteristics of the style generally, are, at any rate, features of such beauty and excellence as to be well worth perpetuating. And they perpetuate them accordingly in their usual mild manner, a manner which culminates at last—if it can be said to culminate at all—in the shrunk shanks of the cast terra-cotta chimneys. The name of Mr. David Brandon is identified with this modern product in a marked degree; others have adopted it to some extent, but they have adopted it more in a playful spirit, and with less apparent conviction as to its real merits. Among the playful and amusing examples, we may note those buildings where the manufactured Elizabethan-revived detail has been mixed with trefoils, quatrefoils, and other bits gathered from earlier styles. These, I suppose, are attempts at eclectic art, but, like all the experiments hitherto made in the Elizabethan-style-revived, they are wanting in vigour, and cannot even make up for this deficiency by any claim to refinement. So many modern country houses and parsonages have been erected in this style that it would be difficult to single out any special example, but we may be quite sure of this, that an architect whose chief works are graced by meek details, whose notions of decoration can be traced in little bits of pierced parapets, jagged or stepped gables, lean, ready-made chimney shafts, unnecessary dormers, and useless buttresses, is not a man likely to advance our art or induce either the critics or the public to look with favour on our profession. A crying defect in nearly all modern works in this same ready-made look of many details. Mantelpieces and internal joinery generally furnish us with innumerable examples of this kind of stuff, but what a man does to the internal fittings of his house is entirely a private matter. Not so, however, when he challenges the observation of every traveller by rail or road. Our gables and dormers, our turrets and chimneys, are often the only features of our residences which are visible to the public. Is it well, then, to invite comparisons which can only possibly tend in one direction? Apart from all question of offence to art or disappointment to artists, is it well to proclaim upon the housetops mean pretentiousness or architectural laziness? For I cannot help thinking that such architects, for example, as Mr. T. R. Smith, must either be the victims of their employers or unaccountably indolent in working out their designs when they present us with the toy-like details which we sometimes see above the tree-tops of our modern manors. Mr. Burges's engineering massiveness is the last thing one desires to see imitated; but there is a vast difference between expensive elephantine hugeness and mean microscopic littleness. There are, I know, too many things, which a modern architect unfortunately has to do in opposition to his convictions; but a systematic setting up of architectural nine-pins on their roofs is hardly more likely to be a *sine quâ non* with country gentlemen than the erection of architectural breakwaters on their lawns. If the influence of the breakwater ends in dissipating the nine-pins criticism will overlook the inappropriate heaviness, but if a cheap, cardboard style of building is found to flourish, there can be no overlooking and no excuse for those architects who have ministered to it. It is just possible that Nash's picturesque plates and Richardson's scratchy sketches are the authorities for most of this Elizabethan-revived work. If there are no carefully-measured drawings to be got, it is quite time that one of the supporters of this style should proceed to make them. Mr. Peek's liberal prizes, offered through the channel of the Institute a short time since, will, no doubt, prove fruitful in their limited (I might say very limited) influence. Perhaps if a better example than Eastbury Manor House were selected, and the whole of the prize drawings and essays published either by themselves or as a supplement to one or all of the professional journals, architects might, perchance, progress so far as to give, now and then, slavish copies of old features — a course which, however mechanical, is less unsatisfactory than that hitherto pursued with regard to the Elizabethan-style-revived.

E. W. G.

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SUFFOLK INSTITUTE OF ARCHÆOLOGY.

[FROM OUR OWN REPORTER.]

THE annual meeting of the members of this Association was held on Tuesday last, the vicinity of Woodbridge being selected as the base of operations for this year. Several of the members assembled on Monday afternoon, and proceeded to visit Wickham Market, Eyke, and Ufford churches. In the evening a *conversazione* was held at Woodbridge Lodge, the residence of R. J. Day, Esq., when many objects of interest were exhibited. On Tuesday morning the members, including the President of the Institute, Lord John Hervey, and Professor Babington, assembled at the railway station, where conveyances were in readiness to take them to Butley Priory. Here the members alighted, inspected the gatehouse, now converted into a farmhouse, examined the numerous shields which decorated the front, alternating with panels of flint work and *fleur de lis*. Upon these shields were emblazoned the arms of England, France, the see of Norwich, the principal families in the county, and the benefactors to the Priory. From thence the members proceeded to inspect the scanty remains of the Priory and Chapel, and an ancient stone coffin, dug up upon the premises. They then returned to the gatehouse, where an interesting and exhaustive paper upon the Priory was read by R. J. Day, Esq., tracing the Priory from its foundation in 1171, by Ranulph de Glandhille, to the present time. From thence the associates proceeded—after a brief glance at the interior of the gatehouse, in which was the piscina of the old chapel, now enshrining a stove—to Butley Church, where the Norman doorway and Late Perpendicular screen attracted attention. They next visited Chillesford Church, whose singular red sandstone tower, attached to a rubble edifice, caused many conjectures as to its origin and date of erection. It was generally supposed to have been built from the remains of Butley Priory, or the walls surrounding Orford Castle, which is in part built of similar stone. Opinions as to its date of erection varied from 1450 to 1700. From thence the members proceeded to Sudbourne Church, where a paper was read by R. M. Phipson, Esq., architect. Here they inspected the fine old Norman font, sadly injured, however, by injudicious "tooling" in removing the paint, the Jacobean three-decker pulpit, canopied by a ponderous, but elaborately-carved, sounding-board, and a handsome monument to Sir Michael Stanhope, displaying a singular mixture of Tudor and Classic architecture, the principal figures being dressed in Elizabethan costumes, while the structure was supported by marble columns having richly-gilt Corinthian columns. They then went to Orford Castle, where a paper was read by the noble President of the Institute, Lord John Hervey, upon its origin and history. He noticed the singular legend recorded by Ralph de Coggeshall, concerning the capture of a strange sea monster, resembling a hairy man, in the sea opposite the castle, and its ultimate escape from the castle to its native ocean depths, and stated that he believed the castle to have been one of those erected by the Conqueror in order to defend the sea coast. Its style of architecture, Early Norman, and its partial encasement with Caen stone, favoured this theory. He stated that it had been successively owned by the families of Bigod, Fitz-Robert, de Burgh, de Spencer de Valoins, Ufford, Willoughby d'Eresby, Hereford, and Hertford. It had recently passed, by special arrangement, from the present Marquis of Hertford to Sir Richard Wallace, who had had the good fortune to be able to lay two capitals under a debt of gratitude to him. At the conclusion of his lordship's paper, the company assembled in the great hall occupying the centre of the castle. This concluded, the members rambled over the castle, ascending to the summit of one of the loftiest towers, whence a glorious prospect displayed itself over a great part of Suffolk and Essex, the view embracing Walton-on-the-Naze and Thorpness. To the east the singular course of the river Alde, which runs for more than ten miles parallel with the sea, in one place less than 200 yards from it, could be traced, and beyond it the German Ocean spread its waters, till sea and sky met in the horizon.

From the castle the associates proceeded to the church, where they examined with interest the massive Norman pillars in the ruined nave; the singular font, surrounded by elaborate carvings of the Crucifixion of Our Lady of Pity, the emblems of the Evangelists, and supported by the "merman of Orford" previously alluded to; the numerous brasses, and the arcade of Early Pointed arches dividing the nave from the aisles, and the remains of the entrance to the rood loft and stairs in the north chancel aisle. It was noticed that during a recent restoration the cross upon the font had been injudiciously altered from its original T shape to the conventional form. A paper was read touching upon the church by the hon. secretary, E. M. Dewing, Esq., and the day's proceedings closed.

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OUR COUNTRY CHURCHYARDS.

WHY rural churchyards should invariably have such an uninviting look about them is one of those things which I am unable to understand. If (says a writer in the *Garden*) there are any special spots in our parishes where we might expect due regard paid to decency and order, surely they ought to be our graveyards. I hold, contrary to custom though it be, the practice of making a mound on the top of every grave a mistake, and one of the prime causes of that disorder which is so prevalent in country churchyards. Surely, we would sleep as soundly under the turf of a smooth level lawn as under an uneven surface, and the proper keeping of a flat graveyard would be easy compared with that of an uneven one. Perhaps, however, the entire absence of any system in the laying-out of graveyards has not a little to do with their uncouth appearance. Niggardliness in the space set apart for the burial of the dead is one great characteristic of our rural parishes; and thus, space being proscribed, the possibility of making a few nice walks and the planting of a few fitting trees and shrubs becomes a matter of grave doubt, if not a comparative indifference. Of course, these are defects which cannot well be remedied in connection with churchyards already in existence; but where new ones are being established it becomes a question worthy of consideration as to whether a sufficiency of space should not be at once obtained, so as to admit of some effect being produced by laying the ground out in such a manner that the gardenesque, so to speak, is not entirely swallowed up for convenience sake, or for the sordid anxiety of making the very utmost of the space allotted for burials. Paths should be at first formed, then the planting of suitable trees should follow, and these should mainly consist of weeping trees, because the habit of growth they display seems to consort best with the character of the place, without giving that heavy, monotonous, lugubrious appearance that arises where trees of the Pinus tribe are wholly used. Flowering trees especially should be planted, such as the coloured thorns, snowy Mespilus, double-blossomed cherry, and the almond. Soft colours, or whites, should be selected, but not yellow, such as the laburnum, as that would be out of place. For foliage trees few are so fitting for planting in a burial ground, and perhaps so seldom used, as the purple beech, added to which, by way of pleasing contrast, should be the variegated *Acer Negundo*, these being toned down with the weeping ash, birch, elm, and other trees of graceful outline. These, with a few others carefully selected, would afford a pleasing variety. Any shrubs employed should be evergreen, or such as could lend additional charm by early blooming. Variegated hollies, Aucubas, Euonymuses, &c., interspersed with some rich greens or bays, Portugal laurels, and bushy growing Pinuses, would at all times furnish the bare sward without adding dulness or density.

If we dispense with mounds, and have merely a level even surface in our churchyards, and if, moreover, they were placed under due superintendence, small flower plots could be made which might be effectively planted so as to render churchyards pleasant and cheerful, rather them places to be avoided as being only suggestive of gloom and death. Could anything in the way of decoration of graves be prettier than having their shapes marked out in the green sward by a margin of snowdrops, inside of which might be a small cross of white crocuses? Or, if a bed be desired, what would be neater for winter and spring than a slightly-raised edging of *Sedum glaucum*, a carpet of *S. acre aureum*, and a cross of *Sempervivum metallicum?* In the spring also pretty designs might be worked out by means of various-coloured double daisies, white and blue Violas, and pansies, lilacs, Aubrietas, variegated Arabis, and many other dwarf hardy plants that are familiar in our spring gardens. In summer, neat dwarf-growing plants that create no violent contrasts should be used; and for centre purposes few plants of modern introduction convey a more fitting conception of melancholy than does the drooping *Amarantus salicipolins.*

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PHOTOGRAPHS OF COLLECTIONS IN THE BRITISH MUSEUM.*

THE collections of art and archæological treasures in the British Museum are admitted, says the *Daily News*, to be among the finest and most comprehensive in the world. They attract learned strangers as much as native sightseers; they are incomparable and inexhaustible sources of instruction. The memorials of whatever man has done upon earth may be studied here in chronological sequence, from the remote age when primitive men lived in caves and scratched on pieces of bone rude outlines of the mammoths which then lived, but which have been extinct for centuries, down to that age which, though we regard it as antiquity, is but a modern period in the world's history, when the greatest of all sculptors displayed their best talents in fashioning the Greek marbles. Rightly to understand and to follow in due order the series of works in the British Museum is what few are qualified for doing and can find the leisure to do. The majority who are less ambitious in their aims cannot afford to spend their days in the Museum. The scraps of time which they might be able to devote to profiting by it are largely consumed in journeying backwards and forwards between the Museum and their places of abode. The principal drawback to a thorough and leisurely study of these treasures of art and knowledge now bids fair to be overcome, if not altogether removed. A series of photographs, comprising 929 large-sized plates, and exhibiting specimens of everything that is most valuable and noteworthy in the Museum, may be acquired by any one who chooses to expend the sum requisite, and thus the British Museum, as an informing and educational institution, is brought home to the dweller in every part of the earth. Moreover, those who cannot afford to purchase the whole series, may buy any single photograph for 2s. Thus, for a sum not exceeding what is paid daily by thousands for admission to an ordinary spectacle, may be procured accurate reproductions of works which not all the wealth of the richest man in Europe or America would suffice to obtain.

The undertaking, which is one of truly national importance, has been planned and carried into execution by a private gentleman, Mr. Charles Harrison, who, to professional eminence as a solicitor, enjoys the reputation of being an accomplished archæologist. Taking upon himself the cost of the photographs, he has succeeded in getting the Trustees to sanction their production. He has written a general introduction to the catalogue of the entire series. The series is grouped in seven parts. The first is the "Pre-historic and Ethnographical Series;" the second, the "Egyptian Series;" the third, the "Assyrian Series;" the fourth, the "Grecian Series;" the fifth, the "Etruscan and Roman Series;" the sixth, "Antiquities of Britain and Foreign Mediæval Art;" the seventh, the "Seals of Sovereigns, Corporations, &c." The subjects have been selected with the aid and assistance of the leading authorities of the Museum, among whom are Dr. Birch, Keeper of the Department of Oriental Antiquities; Mr. A. W. Franks, Keeper of British and Mediæval Antiquities and Ethnography; and Mr. George Smith, of the Oriental Department, while these gentlemen have also performed inestimable service in compiling the catalogue. The value of these photographs from an educational point of view is well shown by Mr. Harrison when referring to Egyptian history:—"Let the college or school tutor attempt to teach a student the lists or chronology of the Egyptian Dynasties, and the subject is flat, tame, and uninteresting; call in aid the excellent dictionaries edited by Dr. W. Smith, and the interest is greatly enhanced; illustrate the tutor's lectures by the contents of the European museums, and the subject becomes one of the deepest interest. Let the evidences each European museum contains be accurately compared and studied. The result must tend greatly to improve the knowledge of the history of man, on his way onward from savage life to a state of civilisation."

Turning to the photographs themselves, we find, first, that they are executed with great finish and artistic feeling, and second, that they are large enough, being from 12in. by 10in. to 10in. by 8in., to give an adequate notion of the subjects represented. Running rapidly over the most noteworthy, we first see the Stone Period, when man dwelt in caves, and made his implements out of flint, illustrated as clearly as if the actual flint implements in the Christy collection were before our eyes. The rows of needles chiefly made of horse's bone, the bones with rude outlines of animals, are as useful for purposes of study and information as the originals. Indeed, some of the articles are more distinct in the photograph than in reality; lines and marks which the eye did not detect being brought into prominence in the absolutely perfect copy made by the sun. Stone figures, whether in the clumsy form of those from Easter Island, or in that of the perfect Grecian marble, make splendid photographs. Before leaving the Pre-historic series, we may note the interesting confirmation of the habits of primitive man which is afforded by the articles still in use among the Esquimaux and the inhabitants of islands in the Pacific Ocean. In one photograph the devices of the Esquimaux, who have no metal, are almost identical with those which have been dug up in France and elsewhere from the receptacle where they had fallen from the hands of primitive man unnumbered ages ago. Not less instructive are the specimens of ancient and modern articles from North America, Ancient Mexico, Modern Mexico, West Indies, Brazils and Guiana, and Ancient Peru. Very striking is it to observe threshing machines from Aleppo, Madeira, and Teneriffe, of modern date, and in which, as in older times, the lack of metal is compensated for by teeth made of flint and lava. The Egyptian series is fraught with interest. Religious ceremonies, funeral processions, mummies of men and beasts, specimens of writing, agricultural implements, musical instruments, children's toys, and furniture, all appear in these photographic sheets as they do in reality. The old Assyrian kings, who owe a sort of resurrection to the labours of Mr. Layard, are here exhibited as they appear on the slabs whereon their persons and achievements were laboriously impressed for the information of posterity. We see them as they were seen by their subjects, engaged in hunting, in fighting; the animals they rode and slew are brought before our eyes; the towns they assaulted, the prisoners they impaled, are vividly reproduced. In one plate is represented the earliest known specimen of transparent glass; in another, the only domestic scenes yet known in Assyrian art: a banquet where the King reclines and the Queen sits at his feet. Mr. Harrison remarks:—"This instance may be cited as one of the earliest representations in which woman is elevated from the merely humble position which she had previously occupied to a state even of companionship with man." There is less that is exceptional and novel, but far more that is exquisite in form and outline, in the Roman and the Grecian series. Very beautiful are the photographs showing sets of engraved stones. Quite as remarkable as the fine examples of sculpture are the terra-cotta vases, some of which are purely ornamental, others are adapted for household purposes, and all are most graceful in design. The Antiquities of Britain bring us back to native soil, exhibiting little that is artistic, but much that abounds in instruction. The specimens of Roman articles constitute, so to speak, the most authentic chapters in the early history of our island. Mr. Harrison observes that "the old popular antiquarian view about these articles is fast dying away; the great use that historians now make of such articles is each day increasing. Much detail of the Roman soldiers' equipment, the bronzes, the glass, the earthenware, and enamels, which evidence Roman life in the settlements, are, by the specimens in the British Museum, most fully detailed; and selections, illustrative of them, are to be found in Plates 906—914. Among the pottery will be found (Plate 911) four specimens from the Roman potteries carried on at Caïstor, Northamptonshire, which are valuable of their class." It is added that, if the articles in local museums in this country, and the collections in foreign museums, were photographed, a vast addition would be made to our exact knowledge of Roman civil and military life. If, for example, the collections of Roman antiquities in the Museum of Wiesbaden were brought before us in the same way as the objects in the British Museum, we should be enabled, by merely turning over the plates, to gain more information about the Romans than by the longest and most diligent course of reading. The examples of Mediæval Art contain, among other things of note, some excellent specimens of Venetian glass from the Slade collection.

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* Series of Photographs from the Collections of the British Museum, taken by S. Thompson, with catalogue. London: S. Mansell & Co.

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STEPNEY PARISH CHURCH.

THE old Church of S. Dunstan, Stepney (or "Stebonheathe"), was reopened on Tuesday week by the Bishop of London, after a restoration occupying a period of nearly twelve months. There are few churches in the neighbourhood of London possessing so much interest, both historically and architecturally, as Stepney Old Church.

It is known that there was a church here during the time of the Saxons, dedicated to "All Saints," and that in the tenth century S. Dunstan, then Archbishop of Canterbury, restored or rebuilt the church, after which it was dedicated to him, and has been called after him to the present time. There is a relic of this early church still to be seen over the entrance door in the south porch—a "rood cross" of stone, about three feet by two, with the figure of our Lord crucified rudely sculptured in bas relief, and the accompanying figures of S. Mary and S. John standing at each side of the cross. The sun and moon are also carved on the arms of the cross, and round the stone is a well-defined foliated border three inches wide. It is in a good state of preservation, considering its great antiquity, and is pronounced on reliable authority to be unquestionably a piece of Saxon workmanship.

For many years the present building has been in a most unsightly and dilapidated condition, the last so-called restoration having been done in Roman cement instead of stone, the embattled work round the church removed and its place supplied with terra cotta 3in. coping, and the faces of rag walls plastered over with mortar and flint chippings, forming a surface that was continually decaying and falling to pieces.

The rector and churchwardens having called a meeting of the parishioners, it was unanimously resolved that a thorough and complete restoration of the church, under the advice of their architects, Messrs. Newman & Billing, should at once be undertaken.

The works, commenced in August last year and now brought to completion, consist of a restoration in Bath stone of all the windows, cornices, battlements, buttresses, &c., throughout the building; also four new windows in bell chamber of tower filled with open quatrefoil tracery, and a new three-light window immediately over the west doorway in tower. The south and north porches, destroyed some years ago, have been rebuilt, with stone dressings, groined ceilings, &c. A new vestry has also been built for the use of the rector as rural dean and the clergy of the deanery. This room is hexagonal on plan, and capable of seating a hundred persons, and, as one of its sides is open to the old vestry, the whole forming one large room, one hundred and fifty persons can well be accommodated. The walls are of black flint laid in coal-ash mortar, Bath stone dressings externally and internally, square-headed three-light tracery windows, one in each external bay; the walls internally stuccoed, and an open-timbered roof stained and varnished, the principals and curved ribs resting on caps, columns, and bases of stone, and the intermediate ribs on carved corbels springing from the hoods of window openings. The roofs of aisles have been repaired and re-covered with lead, and the whole of the windows (except those of stained glass) filled with cathedral glass in diamond quarry-lights.

The interior of the church has also undergone a thorough transformation. The imitation Sienna marble paint has been scraped from the nave columns, showing them now as constructed (of stone). The circular gallery at the west end, projecting so far into the nave, and used for the organ and choir, has been swept away, thereby opening up to view the fine western arch as originally seen and the new stained glass window presented by the Messrs. Charrington. A new organ has been built by Messrs. Bryceson Brothers. The whole of the decorative painting and gilding of the interior of the church has been executed by Messrs. Pitman & Cuthbertson, under the direction of the architects. The chancel floor has been paved with Maw & Co.'s tiles. The coronæ standards, and side lights are of elegant design, and were supplied by Mr. Gawthorp, of Long-acre. The whole of the carving, including the figures of the four Evangelists to the new vestry, has been executed by Mr. J. W. Seale, of Walworth; and the general builders were Messrs. F. & F. J. Wood, of Cleveland-street, Mile End-road. The style of the present building is Perpendicular, with two exceptions—viz., a two-light Decorated window in the north chapel and the sedilia in south wall of chancel, which is thirteenth century work. Mr. Richards has acted throughout as clerk of the works.

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THE USES OF BLAST FURNACE SLAGS FOR BUILDING PURPOSES.*

IF we may characterise the aim of metallurgists twenty years ago by any one point toward which their efforts were especially directed, we should say it was the idea of adapting "waste products" to some useful purpose, while the energy to-day seems rather to take the direction of so arranging processes as to have no "waste products." The iron master of this decade no longer speaks of the *waste gases* of the blast furnace. The supply of combustible material from this source is a part of the regular working, and is depended upon to such an extent that in many cases it is doubtful whether the iron could be profitably manufactured without its use. This is an economical age, and in large works the same care that looks after the saving and utilising of material not hitherto available, presupposes, as a general thing, skill in the manufacture of the product. There is hardly a point in the whole range of metallurgical detail where more or less successful attempts have not been made to economise, by the use of "waste products," and no one thing upon which greater skill has been lavished and so much money spent. The operations are so large, the capital involved so great, that a comparatively small saving will often justify even the abandonment of one process for another, as was the case in the intoduction of Patinsonage in place of the costly process of enrichment by Cupellaton, and the substitution, recently, in many places in Europe, of the zinc process for Patisonage.

In the metallurgy of iron the most cumbersome, expensive, and useless product is the blast furnace slag. The variety and ingenuity of plans proposed to make use of it, or in some way utilise the heat it absorbs, or at least to get rid of it, is only equalled by the persistent want of success which these efforts have, until within a few years, attained. The amount of slag which flows from an ordinary blast furnace in twenty-four hours may be calculated at very nearly twice the production in iron by weight and five or six times by bulk. The amount of heat absorbed by and radiated from this mass of material, if it could be transformed into horse-power, would make very important changes in our present methods of manufacture, and materially diminish the cost of iron. Besides the large amount of heat lost in the slag, it is a constant source of inconvenience, accumulating near the furnace, as a hot viscous mass, difficult to handle, requiring special tools for its removal, and necessitating the investment of a large amount of capital in land on which to pile it, which brings no return of any kind. The labour spent upon this unproductive substance is often equal to the whole of the productive labour of the furnace. Hence the amount of skill lavished, first to make use of it, and then to get rid of it.

The first attempt, and, for a long time, the only one, to use it was in making roads, for which it was simply broken up by hand, and then used like any other stone. Though in themselves excellent road-making material, this form of slag is not well suited for it, and hence, as this is the only use generally known, we find enormous slag heaps, which are often over 100ft. high, served by special engines and cars, in the vicinity of many of our blast furnaces. Happy the company, who, like the Hudson Iron Works, can use their slags to fill in shallow bays, and thus by an actual production of lands, turn all their slags to profitable account.

In some parts of Europe where stone is exceedingly scarce, this is the only material for road-making that can be procured in large quantities. Hence in such countries as Silesia, every effort has been made to make the only material they have as well adapted for the purpose as possible.

The great objection to the use of slags is their brittleness. Hence very early attempts were made to devitrify them at a small cost. This necessitates a cheap fuel, which is generally an exception, and hence the most successful attempts at devitrification have been the accumulation of this slag in large masses, allowing it to cool slowly under considerable pressure. This is the case at Tarnowitch in Silesia and elsewhere where the ground around the furnaces is encumbered for days together with large accumulations of slag, 1ft. or 18in. in thickness, which are left to cool. This method is necessarily imperfect. Only the lower half of the slag is devitrified; but imperfect as it is, it furnishes an excellent material for paving, and the traveller would generally be astonished to learn that the pavement over which he rides is nothing more than an imperfectly devitrified blast furnace slag. As only a very small portion of the slag can be used in this way, slag heaps in Silesia would be quite as prominent a feature of the landscape as they are in the Lehigh Valley, if the furnaces were as numerous. The benefit in this case is on the side of the road maker, rather than on that of the iron manufacturer.

The necessity of having building stone in certain countries of Europe, where it is very scarce, led to a long series of experiments, which, after a multitude of failures, resulted in the manufacture of a very useful product for certain kinds of construction. These experiments began at a charcoal blast furnace, the slag from which was taken out of the fore-hearth with a ladle, compressed into a mould and cooled slowly. In order to keep the slag in the hearth from becoming cool it was covered over with charcoal. A small quantity of the powder of the charcoal became mixed with the slag, and effected a partial devitrification in the moulds. The attempt to apply this exceedingly simple process to a coke furnace failed entirely. The bricks became too porous from the evolution of gases resulting from the admixture of coal-dust. Sand and coke-dust were then substituted, but as the bricks were still fragile they are now annealed in furnaces. This process is applied in Konigshutte, in Silesia, to the manufacture of building material, of which some of the important constructions of the works are built. The slag is run from the furnace into a hemispherical basin on wheels. The bottom of this basin is covered with sand or fine coke-dust, to the depth of about three centimetres. The waggon is then drawn to the point where the bricks are to be made. The slag and sand are mixed together with a curved iron tool until most of the gases have escaped, and the mass is about the consistency of dough. It is then drawn with the same tool into a mould with a hinged cover and punctured several times to let out the gas. The cover, which fits into the mould is then turned down and the slag becomes compressed. By the time three or four moulds have been filled, the first slag brick is sufficiently solid to be removed. This is done by raising a clamp which allows the mould to separate. The red-hot brick is now drawn into a kiln, covered over with powdered coal, and left to anneal. Each kiln contains 1,000 bricks, and is from three to four days in cooling. Four men can make 500 of these bricks in three hours. The loss in the manufacture from breakage is about 20 per cent. The cost of annealing is about two thalers the 1,000. These bricks are rough on their surfaces, but on account of their larger size do not require more mortar than an ordinary brick. They do not readily absorb moisture, and for that reason are extensively used in the construction of foundations. The pillars supporting the main wind-pipes at Konigshutte are built of this material. In Silesia these bricks cost 25 per cent. less than ordinary brick.

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* A paper read before the American Institute of Mining Engineers, by T. Egleston, E.M.

A brick much inferior to these in every respect is made in the Hartz Mountains out of the lead furnace slags, which are silicates of iron. These are moulded and compressed, and are used for buildings. As the bricks are very brittle, the constructions in which they are used are generally covered with a coat of mortar. The buildings of the immense mechanical preparation works of Clausthal are built of this material.

Mr. Sepulcre, a Belgian engineer, was one of the first who successfully transformed the slag into a stone which could be generally used. This he effected by clausing the slag channels to terminate in an excavation whose sides had an inclination of about 30°, and whose capacity varied from half to ten cubic metres. The very steep inclination of the sides causes the section of the pits to increase very rapidly, and this allows the solid crust, which forms on the surface of the liquid slag, to rise with it without becoming attached. The slag must flow continuously into the excavation, and if, for any cause, there is an interruption, the crust must be raised to allow of the liquid material flowing underneath. In this manner the whole mass of slag in the pit is sure to be all liquid, and will solidify from above and under pressure. After the excavation is full, it is left for five to ten days to cool, the only precaution required being to cover the top with ashes or sand to a sufficient depth to prevent the mass cooling too rapidly. The stone so produced grows hard on exposure to the air. When first made it can be easily broken into any required shape, but after exposure for a period more or less long, it becomes so much harder as to require double the number of tools to work it.

All kinds of slag are not suitable for this manufacture; those which contain too much lime fall to pieces on exposure. In general, it may be said that they should contain from 38 to 44 per cent of silica, and that the furnace should be working well.

According to experiments made at the Conservatoire des Arts et Metiers, in Paris, this stone, when made from slag while the furnace was running on white iron, never became fissured under a pressure of less than 242 kilogrammes the square centimetre, and was crushed at a pressure of 886 kilogrammes as a minimum. When made from gray iron they do not crush under a pressure of less than 405 kilogrammes but they have fissures at a pressure as low as 222 kilogrammes, or a little less than the white iron slags. This material is, therefore, stronger than the best marble.

One of the Belgian furnaces which produce 2,500 tons of slag in thirty days, made from it 1,177 cubic metres of stone. The expense of manufacture was 820 dollars. The material sold for 1,600 dollars, making a profit of 780 dollars in thirty days; 70 per cent of the slag produced was profitably used. In order to introduce it the price was put 25 per cent. lower than ordinary stone.

In certain parts of Germany, and during the late war in our own country, basalt and certain volcanic rocks were used in the manufacture of glass. But little is wanting in certain blast furnace slags to make them of the same composition as basalt, and this fact suggested their use in the manufacture of glass. The experiments which were made with slag were so successful that in some parts of Belgium some of the glass makers have contracted with the blast furnaces to furnish them a certain amount of slag every week. One furnace producing thirty tons of cast iron in 24 hours that I visited, during the last summer furnished one day's run of slag per week to the glass makers. To prepare it for this use the slag is run out on cast-iron plates and cooled with water.

Attempts have been made in some parts of Europe to use the heat evolved by the slags for domestic purposes. The most simple and the most practical one is the employment of the heat of the slag by the men for cooking, or heating their food already cooked. Attempts have been made to use it for heating the house, near the furnace, by allowing it to run into iron moulds and placing them in a drum; but the expense attendant upon it, and the trouble of constantly changing the slags, probably cost more than the saving of fuel, and undoubtedly kept the unfortunate persons who were subject to this expensive economy in an uncomfortable state both of mind and body.

Mr. Minary, Director of the Franche Comte Iron Company, conceived the idea of using the slags by granulating them as they flow from the furnace. To do this the trough through which the slags run is made to terminate in a stream of water which has sufficient velocity to carry the grains of slag into a pit prepared for it, from which it is charged into waggons, without further expense, by an endless chain with buckets. The engine for this purpose is run by the gases of the furnace, and requires scarcely a horse-power. In these works, which consist of five blast furnaces, each producing 20 tons in twenty-four hours, the introduction of this improvement resulted in a saving of the wages of twenty men occupied in charging the slags, and of five blacksmiths who prepared their tools. Much larger waggons were brought to the furnace, which, as the granulated slag can be discharged at any height by the endless chain, were for the most part railroad cars. No one is now employed to look after the slags, as the whole of the work can be done by the founder and his assistant. The saving thus effected amounts to 5,000 to 6,000 francs a year, while the cost of granulation does not exceed 0·07 dollars the ton of slag. This rendered the slag portable by the ordinary methods of transportation, did away with all the special tools formerly used, and reduced the labour of getting rid of the slag to almost nothing.

The granulated slag was first used as gravel in the works, and to make the bed of the casting house. It was found that from such a casting bed the pigs came out clean and bright, and were preferred by the puddlers even to those cast in iron moulds. This method of using the slag is now of almost universal application in the Siegen district, in Prussia, where most of the furnaces run on spiegel. The grains of iron which the slag contains were formerly separated by stamping. They are now separated by the granulation and are caught in a receptacle for the purpose, while the light porous slag is carried off by the water, thus avoiding the expense of crushing and washing to which all the furnaces were subjected before the method of granulation was introduced. It is also extensively used in some parts of France and Belgium.

(To be concluded.)

THE SCHOOL BOARDS.

Bideford.—The Bideford School Board has requested Mr. Oliver, architect, of Barnstaple, to meet the Board for the purpose of preparing a plan as may be directed with a view to an alteration of the National and British Schools, to meet the increased accommodation required by the Education Department.

London.—The Works Committee of the London School Board, having considered the designs submitted in the limited competition for the schools to be built on the site in the Bolingbroke-road, Battersea, recommended, in their last report to the Board that Mr. John W. Walton be appointed the architect for carrying out the erection of the school, and that it be referred to the Works' Committee to draft specifications, obtain tenders, and bring up a contract to the Board for sealing. The number of children to be accommodated is 480; cubical contents, 170,202ft.; estimated cost, £3,595; cost per child, £7 9s. 4d.; cost per cubic foot, 5·06d. The recommendations of the Committee were adopted.

ARCHÆOLOGICAL.

Interesting Discovery at Gorleston Church.—During the progress of the works connected with the restoration of the fine old church at Gorleston, near Yarmouth. the workmen discovered traces of some rich colouring on the north wall of the edifice, which, on being carefully exposed, proved to be a fine specimen of mural painting. The precise subject has not yet been ascertained, the workmen being still engaged in carefully removing the plaster beneath which the painting has so long been hidden. Drury, in his history of Gorleston Church, recounts the fact of the walls being at one time adorned with paintings, and we believe that it was this record that led to the discovery in the present instance.

The Chantry House, Castle Donington.—Many will regret (says the *Derby Mercury*) to see the removal of the old Chantry House from the Churchyard, Castle Donington, which was much admired. Dr. Wilson Pearson, a Vice-President of the British Archæological Association, who, in 1862, wrote a paper on the Mediæval history of Castle Donington, says it is highly probable that Thomas Hasilridge, who founded the Chantry in 1509, conjointly with Harold Staunton, was Sir Robert Hasilridge's son. Elenora, mother of Thomas Hasilridge, died in 1592, and the chantry had then been licensed for upwards of twenty years "for one priest to sing divine service in the Chapel of our Lady, there to pray for the founder's soul, &c." The Chantry House, where the priest resided who chanted masses daily, is supposed to be still in existence, although the changing hand of time and alteration has despoiled it of its primitive simplicity. The old building, judging from the quaint-looking gable which projects into the churchyard, was nothing more than the "frame and pane" Domestic architecture common in the middle-class houses of that period.

Building Intelligence.

CHURCHES AND CHAPELS.

Brixham.—A new chancel has been added to Holy Trinity Church, Higher Brixham. No chancel existed in the original church, and the site has been quarried out of the solid rock in the rear of the present building. The new work consists of a chancel terminating with an apse, with a bay on either side, the organ chamber occupying the northern portion, behind which is the vestry, which is entered by a priest's door from the north-east side of the building. Low chancel rails of open work in Bath stone, enriched by Devonshire marble columns, separate the nave from the chancel. The walls are of local limestone, and the dressings throughout are of Bath stone, from the Corsham Down quarries. The builders are Messrs. Bragg & Dyer, of Paignton. The sculpture and the stone carving is by Mr. Harry Hems, of Exeter. The style of the building is Early Decorated, and it has been designed by Mr. E. Ashworth, of Exeter.

Manchester.—A new Baptist Chapel in Moss Lane East, Manchester, was formally opened on Tuesday. The style of the building is Gothic. The entire range of buildings, comprising the chapel, schools, vestries, &c., covers a space of ground measuring 106ft. by 135ft.; and the chapel itself is 98ft. long and 49ft. wide, the width across the transepts being 60ft. The height of the front gable is 65ft. The interior is divided into nave and aisles, separated by iron columns and timber framing, and it contains 850 appropriated sittings. Galleries run round three sides of the building. The architects are Messrs. Paull & Robinson, S. Peter's-square, Manchester, and the general contractor is Mr. Joseph Robinson, jun., of Hyde.

Oughtrington.—The new Church of S. Peter, Oughtrington, has been consecrated. It is designed to accommodate 450 persons, and consists of nave and two narrow aisles, apsidal chancel with tower and spire on its north side, double vestries, and south porch. The whole is built of local "split-faced" stone in random-coursed work, with dressings, tracery, &c., of Alton and Hollington stone, and strings, labels, cornices, and bands of red Runcorn stone. The interior, excepting the aisles, is faced with stone in the same way. The great feature of the church is its apsidal chancel, 40ft. long and 23ft. wide. The apse is on the same plan as that of Westminster Abbey. Three of its sides are faces of an octagon, described inside a semicircle of the width of the chancel, the other two sides being slightly inclined from the chancel width to the apse width, thus forming a most perfect apsidal plan. The tower, as before mentioned, stands north of the chancel, and up to the belfry stage is square. Above this it is octagonal, with a two-light window in each side, and clustered pinnacles at each angle of the square. On this rests the spire, which has six rows of cusped circles. The total height of the tower and spire is 140ft. The total inside length of the church is 106ft., and the width 49ft. The height of the nave is 54ft., and up to the stone vault of the chancel is 34ft. The church has been designed by Messrs. Slater & Carpenter, of Carlton Chambers, London, Mr. Peacock acting as clerk of the works. The contractors were Messrs. Simpson & Co., Tottenham-court-yard. The cost has been about £7,000.

BUILDINGS.

Bishopsgate.—The foundation stone of the new Ward Schools for Bishopsgate was laid yesterday (Thursday) week. These schools will form part of the range of buildings on the plot of ground between Skinner-street and Primrose-street, which have been erected owing to the important alterations consequent on the railway works close by. The new building adjoins the school chapel, opened a few months ago, and will be of a good substantial character, the basement being of granite, and the superstructure of best malm bricks. Accommodation will be provided for 700 children. Mr. W. H. Heath (Hovenden, Heath, & Berridge) is the architect, and Messrs. Scrivener & White are the builders.

Elmham, Norfolk.—It is expected that the Prince of Wales will lay the first stone of the Norfolk County School buildings in the course of the autumn. A site comprising thirty-eight acres, with a river frontage of half a mile, has been obtained near the Elmham station of the Great Eastern Railway. The buildings, which are to be erected from designs by Mr. Giles, will furnish accommodation for 260 boarders, at an estimated cost of £8,000.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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RECEIVED.—J. S.—J. S. S.—J. Cranston.—W. B. & Co.—W. Y.—L. T.—W. F.—B. Y. S.—W. W.—J. J. C. & Co. C. L. E.—G. & V.—C. B. A.—E. G.—W. & Co.—J P. S.—E. T.—School Planner.—E. W. G.—J. A. S.

M. B. ADAMS.—Sketches returned.

SLATER & CARPENTER.—The plan and description of Holdenby House next week.

GOULTY & GIBBONS.—Drawing of school to hand.

W. O. P.—Rules to be observed in planning and fitting up of schools, issued by the Committee of Council on Education, p. 160, No. 894, February 23, 1872. Rules for planning and fitting up schools, issued by the London School Board, p. 356, No. 904, May 3, 1872.

J. JACKSON.—We gave an exterior view of the Bradford Town Hall, November 19, 1869; an interior, December 17, 1869; and another exterior, February 18, 1870. Copies can be had.

W. FOX.—The number is out of print.

C. T.—We feel certain that your suggestion to apportion the rate of wages by assessors appointed by Act of Parliament would not work.

MILNES & FRANCE.—Photo. of bank to hand.

TO E. C. M. AND MANY OTHERS.—See our short article on "The Press and Post-office."

WANTED, a good Architectural Draughtsman, to Prepare Pen-and-Ink Drawings for Photo-Lithography. Address Bedford, 22, Bedford-street, Strand.—[ADVT.]

◆

Correspondence.

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SCOTTISH ECCLESIASTICAL ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—Many of your readers, no doubt, have perused with varied feelings the harsh attempt of Mr. Gildard to throw discredit on the progress happily made of late years in Scotch church architecture. The Presbyterians, however, are not of his persuasion. Glasgow may well be proud of her churches, and both in Classic and Gothic takes the foremost place in Scotland. The decent magnificence of later churches is no mean evidence of Christian liberality, and, to my thinking, is worthy of all imitation.

I would call attention to Mr. Gildard's inconsistency in calling out for a plainer and more simple style of edifice and service, and for the Greek as the best exponent of his Puritan ideal. He forgets, surely, that the desire to make the church not less splendid than the private houses of a city is the same feeling (only without the force of law) which raised the temples he so much admires, and with their bright example before him he tells us that the Greek is the true style for Protestant churches, because its beauty aims at unadorned simplicity!

Is it necessary to remind Mr. Gildard that the oft-refuted sophism of his appeal to the primitive simplicity of the upper room and the mountain-side will carry him much further than he would desire to go? The "barren" order of architecture and the artless notes of uncultivated psalmody are by no means invariably associated with pure and undefiled religion. He will pardon me if I suggest to one who feels so deeply the humiliation of having to wear integuments at all, that he might walk out in fustian or corduroy as the primitive architect modelled on the fashion of the *Quarterly Review*.

Joking apart, however, I take serious exception to Mr. Gildard's assumption (for it is nothing more) that Gothic is the mother of abominations. The corruptions he deplores rose and ripened under the shade of Classic buildings long before the Lombards had crossed the Alps. Mural decoration found ample space to develope itself in the long basilica, and Classic parallelograms are, perhaps, better for orchestral and choral services than a cathedral of nave and aisles and many holes and corners. As to stained glass, I think this luxury an absolute necessity to counteract the mesmerising influence of the glare and vacuum that seems inevitable in the plain tea-caddy style which is being superseded.

It appears, moreover, that Mr. Gildard is not a very consistent admirer of primitive simplicity. He commends some specimens which certainly are not unadorned. What does this show but that the Classic satisfies our feeling of the beautiful just in proportion as it escapes from uniformity and borrows the spirit of the Gothic in the complexity of its details and picturesqueness of outline?

After all, Mr. Gildard's ideal of a Presbyterian church seems to be that it should be "comfortable," in which we all agree—only many would have elegance and solemnity of grandeur as well.

In the matter of economy and running into debt he is sound, but high authorities say that Classical architecture, by the large scantlings and other items, is by far the most likely to entail unnecessary outlay.

I am not at all sure that an appeal to primitive times would leave us as naked as Mr. Gildard seems to think and to desire. S. Paul always preferred the synagogue where he could get it, and if he had been offered the Parthenon for a church would not have demolished it after the fashion of our Scottish fathers—the citizens of Glasgow being the only honourable exceptions. In the matter of instrumental music, he is at wider variance with the facts. The Christian disciples were quite familiar with instrumental music, they were continually in the temple, and joined in its worship to the last. In fact, the construction of many of the Psalms is highly artistic, and based on the alternations of vocal and instrumental song, and if Mr. Gildard will turn up the 150th Psalm, I am sure he will be satisfied that what was good for the author of that Psalm, for S. Peter and S. Paul, and the Christians of the first century, we may be allowed to have (if we desire it) in 1872.—I am, &c.,

ANOTHER PROTESTANT AND ARCHITECT.

Edinburgh, July 8.

SCHOOL PLANNING COMPETITION.

SIR,—The good of this competition will consist largely in the discussions that may be evoked, and, doubtless, it will be wise to foster such discussion before as well as after the publication of the plans. I have taken the opportunity of questioning the propriety of lighting a one-story school from the back, where the area was sufficiently large that by skilful planning the light might have been obtained from any quarter most perfect and desirable. The answer of the architect in the case referred to was in effect that the doors and fireplaces and "clause 4" prevented any other arrangement than back light. Quite so. You see, the lighting of the school, which is one of the most important considerations, is made subservient to minor matters. This, I submit, is "evidence of bad planning," and goes to show that architects do not yet thoroughly understand the matter, and it is to be hoped that this competition will throw some light on the subject.

Again, lighting from the back has also been advocated at the Architectural Association, where my first letter was referred to in terms of courteous disapproval, but unfortunately, the bare assertions there made were not backed by arguments of any kind, or reference to any precedent. Now, let us discuss the matter dispassionately, and I care not who engage in it so long as personalities are avoided. Moreover, the subject of anonymous authorship has long been settled, and need not now be disentombed as a correspondent last week endeavoured to do. Let us first start upon right premises. Reading, writing, and arithmetic are the chief occupations carried on in the school, and as regards light and ventilation it does not greatly signify which of the three classes of study the children are engaged in. The requirements are very nearly the same in each case—viz., the light to be full, sufficient, and unobstructed upon the papers or what not upon which the children are engaged, sufficient light upon the blackboard or map held up before the class, and the master also wants the light upon the children's faces that he may see at a glance what they are about. Which is the best method of meeting these requirements?

Lighting from the back has been advocated, but, as we have before said, no arguments or precedents were brought forward in its favour. For the purpose of testing this principle I attended a chapel during the last few days that is remarkable for its free, light, and cheerful aspect, a result which owes itself to unusual quantities of window space. A gallery runs along the four sides, and the seats longitudinally also, consequently, in all cases, the light came from the back, although, of course, assisted by the cross or diffused light. Well, what was the result? The people in nearly all cases cast their own shadow on the book, while the features were in a great measure obscured by being placed in shade. This would be intensified if the light came from one side only. It is exactly the same in writing or drawing. Let any architect place his drawing-board in such manner that he stands between it and the window or windows, it matters not how many, and what would be the result? Just try it in your own office, as I have done, and the effect of shade and shadow will be so great that you cannot see to draw properly at all. The same argument applies to children in school. Nor will any amount of window space obviate the direction in which the light travels; in fact, the stronger the light the deeper the shade or shadow with which the child obstructs himself, consequently a needless strain upon the eyes is thus inflicted.

It is generally acknowledged that the best light comes from an angle of about 45 degrees toward the left, high up the wall, of course, as in the Prussian system, and as generally adopted in our own class-rooms. But so far as I can learn, no argument has yet been adduced to show why the principle should be reversed in a large school-room. Now refer to schools of great length where it is impossible to obtain sufficient light from the side. The difficulty is sometimes got over by placing a strong light in front, which is thrown direct on the child and the desk; and also by a small back light, which helps to diffuse or spread the light, and to throw sufficient rays on the blackboard. I am not alone in considering this method far preferable to the reverse of that order. I have this day consulted with a schoolmaster for whose use I am about to erect a school, and he entirely concurs in this view. He wants the light full on the children, which is far more important than the light on the master, and the children want the light upon the papers upon which they are engaged. Will back light give this result? The answer in the negative is as clear as noonday.

But the advocates of the back light system say that it should be kept "high up the wall." When, however, we remember the kind of humanity that generally constitute school boards, who look with very jealous eyes upon spending the ratepayers' money, and that clause 2 will allow of walls being 11ft. high only to the wall-plate, which means in that case the light cannot exceed 10ft. from the floor, and that in the majority of cases it is only too probable these bare limits will not be greatly exceeded, their argument then falls to the ground. But even if the windows were carried to 12ft. or 13ft. from floor, it must be obvious that the shadow falls on the paper or book, and the features of the child are also partially obscured by the shade before referred to.

The question then comes, which is the best possible light for the purpose? I am of opinion that too much light cannot be diffused in a school-room, and that a picture gallery, or, better still, a billiard-room (having both top and front lights in equal proportions), is the best system which can be devised, for by it the distribution of light is thorough, although a little strongest from the front. Moreover, the system of top light affords the best opportunity for complete ventilation. Stables, billiard-rooms, picture galleries, and railways are lit and ventilated in this way, because the plan is considered most feasible and perfect. Why should it not be also for a school-room?

I have lately designed a school building, now in course of erection, in which I have seized the opportunity of practically testing the methods which I advocate. The wall light comes from the front, the aspect of which is studiously kept due south, but the roof is carried out 5ft. at a flatter pitch to form a protection in inclement weather, and to soften the clear rays of the sun. In the back roof, which is towards the north, a kind of skylight is inserted over each row of desks. From these skylights the light is radiated or diffused, and falls on the desks without casting any shadow, also on the blackboard and the teacher; but still the greatest light comes from the front. The skylights are ventilators, so also are the wall lights *below* the transom, so that a current, always to be graduated, passes from about 4ft. of the floor upwards across the room, but not sufficiently near the heads of the children to affect them by the draught. I might give other particulars; but as the author cannot be divined, it is now unwise to do so. I give it, however, as an instance, far preferable to the methods advocated at the Architectural Association. But I should like to see the various methods more fully discussed.—I am, &c., H.

Sir,—In order that this competition may be invested with additional interest, and lead to really practical results, I beg to offer the following suggestions:—

1. That as some first-rate designs may reasonably be expected, the London School Board should be asked to co-operate, and one of their large school sites be selected (instead of a merely imaginary plot of land), and that they be invited to examine the designs (in concert with the promoters of this competition), and select therefrom one suitable for execution, and to employ the author to carry out his plans at the usual commission of 5 per cent., or such modification of his plans as may be deemed desirable.

2. That the design considered next in order of merit should receive half the premium, provided the first design was really carried out.

3. That the fullest particulars be issued (by publication in your journal) as to the general distribution required, and specially as to the accommodation to be provided in the school-rooms and class-rooms.

4. That it would be desirable to give some guide as to the area and capacity of cloak-room accommodation required, and that at least 4 basins per 100 be provided in the lavatories.

5. That it should not be deemed necessary to make special plans for ventilation and warming, as it may be with reason assumed that these points could receive proper attention in the event of any of the designs being carried out; and as artificial means of ventilation really involve consultation with parties who specially give attention to this class of work, it would simply trouble the competitors to seek their advice unnecessarily. Open windows and fireplaces, I would venture to suggest, should be assumed for the purposes of this competition, so as not to complicate these subjects too much.

6. That plans of all the floors, two sections, and one elevation—be considered sufficient.

7. That no perspective views be received, or, if admitted, that a perspective view in every case be made absolutely binding, otherwise the competitors will not compete on equal terms; but as the judges are men who will readily understand geometrical drawings, a showy perspective is not needed.

8. That while it is desirable to open the competition as widely as possible to architects who are competent, from experience, to make a good design, it is not desirable to receive the idea of every novice, or the very youngest members of our profession, and that therefore an entry fee of one guinea be paid with every set of designs sent in.

9. That ten of the designs (considered in order of merit by the judges) be illustrated in the Building News; and although some gentlemen may be disposed to object to the proposition of an entry fee so large as one guinea, I venture to think that ten good designs for schools will be a very good exchange for such a sum; and, moreover, that if the perspective view be excluded from the competition, far more than a guinea will be saved in the preparation of each set of drawings.

10. That the guinea entry fees be formed into a competitors' prize, and that the competitors themselves be allowed, by vote, to select the design to which this prize may be awarded.

Should the foregoing suggestions, with others that have been or may be made by your several correspondents, be adopted, the competition would assume proportions that might fairly command the attention of some of the most artistic members of the profession, and at least three premiums or prizes would accrue, in all probability—

1. The execution of the building at the usual commission, and half the premium offered by the promoters of this competition.

2. Half the premium awarded by the promoters of this competition.

3. The competitors' prize.—I am, &c., T. P.

Sir,—I think, if we take into consideration that our agricultural districts and villages generally are so badly provided with efficient school accommodation, and that the resources for providing same are often so limited, you would be conferring a great boon on persons interested in this object, if your proposed competition could embrace a design for a village school for from 60 to 100 children—mixed—with suitable married master's residence attached, the beautifying (sadly needed) of our village architecture to be considered, so far as compatible with strict economy, in the preparation of designs.

If my suggestion is worth the space in your valuable paper, kindly insert.—I am, &c.,

Yorkshire, July 10. Rusticus.

Sir,—I think this school competition will excite some interest in the profession, and make explicit several important matters connected with school planning, in which most architects are now in a fog. Let the various "points" be fully and fairly discussed *before* competitors go to work, that they may know what they are about, and very great interest could not fail to be infused into the subject. I am glad you have taken the initiative in this matter.—I am, &c.,

Cornish Subscriber.

Sir,—Would it not be desirable that the proposed school competition be put off till later in the year, when it would not interfere with outdoor sketching?—I am, &c., R.

PRIZES AT UNIVERSITY COLLEGE.

Professor Lewis presents his compliments to the Editor of the Building News, and would be much obliged by his mentioning in the next number that the medals given as prizes in his classes at University College were the Donaldson silver medals. The omission of the above was in Professor Lewis' own list.

9, John-street, Adelphi, W.C., July 8.

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LAND AND BUILDING SOCIETIES.

Friendly Societies and Building Societies.—The second part of the second report of the commissioners appointed to inquire into friendly and benefit building societies has just been issued. It consists of evidence taken in London during 1870 and 1871 on friendly societies and working men's clubs, and also evidence taken in Scotland, Ireland, and the provinces of England during 1871 on friendly societies, benefit building societies, &c. In the first part of the report of the commissioners, published shortly after the opening of Parliament, the Irish Registrar's Office was described as being in an unsatisfactory condition. Since that time a correspondence has taken place between the Irish Registrar and the chairman of the commission, and it is published in the present part of the report. The Registrar says it appears to him that the extended inquiries which the commissioners have thought fit to make as to the state of the register, the condition of his office, and his hours of office attendance, have been based rather upon their own ideal conception of what might be or ought to be than upon any practical consideration of what has been actually enacted by statute, directed by the Secretary of State, or allowed by the Commissioners of her Majesty's Treasury. The Registrar contends that he has acted according to what he inferred to be the views of the Treasury and of the Secretaries of State, and does not coincide with the commissioners in what they say as to the unsatisfactory condition of his office.

The Birmingham Friendly Building Society.—The twelfth annual meeting was held on Tuesday evening, at the offices, 44, Waterloo-street. The report stated that the income for the past year had been £11,349 7s. 9d., making the aggregate receipts £104,000 14s. 11d. The gross profits, including the balance brought forward, amounted to £3,066 0s. 6d. After payment of the interest to depositors, discharging all management expenses, and placing to the credit of the ledger accounts of investing members compound interest at the rate of 6 per cent. per annum, and 5 per cent. on the current payments, the balance of the reserve fund was £1,459 10s. 4d.

City of Rochester Building, Land, and Investment Society.—The annual meeting of the shareholders and members was held on Monday. The report stated that notwithstanding the continued depression in house and landed property, the directors were enabled to report a satisfactory progress in the transactions of the society during the past year, the amount of business effected being larger than that of any corresponding year. The directors had appropriated a balance profit for the past year equivalent to 6½ per cent. on the shares of the investing members. The balance-sheet showed that £4,404 had been received in subscriptions from borrowing and investing members, £595 from property redeemed, £518 from property sold, £221 from rents, and £68 from fines, fees, and discounts, making the total income during the past year £7,134 13s. 9d. On the other side of the account, £5,127 had been advanced to members, £3,403 paid to members on withdrawal, £103 for repairs to estates in possession, and £190 of loans to the society repaid, the total expenditure leaving a balance of £1,064 due to the bankers. The capital of the society was £14,982.

Intercommunication.

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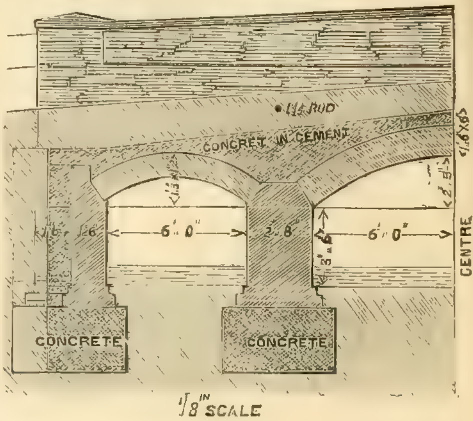
QUESTIONS.

[2604.]—**Foliage.**—A list of those plants and flowers which are specially suitable for stone carving would oblige—An Amateur.

[2605.]—**Strength of Brick Bridge.**—Will one of your readers give a short formula by which can be calculated the safe weight a brick bridge will sustain on each superficial foot of its surface, erected as per sketch, the roadway over being 20ft. in width between side walls?—Querist.



1/8 in SCALE

[2606.]—**Ornamental Brickwork.** — Can any reader, inform me in what parts of England the best examples of ancient ornamental brick building may be found?—D. F.

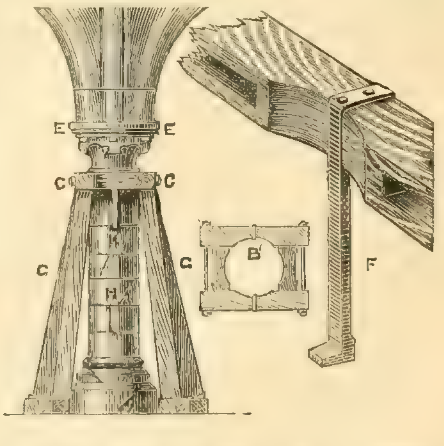
[2607.]—**Cylinders.**—Will some one give me the rule for ascertaining the difference in the strength of a solid cylinder and a hollow one when both are made of the same material? Also the difference in strength of a cast-iron hollow cylinder and a wrought-iron ditto.—Amateur Builder.

[2608.]—**Framed Floors.**—What is understood by framed floors, and when are they used?—Amateur Builder.

REPLIES.

[2594.]—**Moresque Style.**—There is one work in the French annexe of the Exhibition which might assist "Master Builder." It is called "L'Architecture des Nations Etrangères," and treats largely of the architectural styles peculiar to Egypt, Tunis, Morocco, &c.—Architect.

[2598.]—**Shoring.**—The accompanying cuts, taken from Viollet le Duc's Dictionary, illustrate what is wanted by "One in Need." A framework of stout timber (detail B) is placed around the column just below the capital. This is supported by eight timbers, G, which are fixed at the base like ordinary shoring.



The interval between the frame C and the abacus is then well filled with rough masonry, when the damaged stones may be removed. If one stone or more at the top of the column happens to be perfectly solid, the arrangement shown in the elevation at K, and in detail at E, is made use of.—C. P. E.

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It is announced that the old established business of Messrs. J. & W. Eastwood, as lime, cement, and brick manufacturers, and merchants, carried on for so many years at Wellington Wharf, Belvedere-road, and Canal Bridge Wharf, Old Kent-road, has been joined by some gentlemen of means and character, and has been registered as a limited liability company (both Messrs. J. & W. Eastwood retaining a considerable interest in it), and that the business will in future be conducted upon an extensive scale at the same premises, under the style of "Eastwood & Company, Limited."

PARLIAMENTARY NOTES.

THE INHABITED HOUSE DUTY.—Mr. W. H. Smith asked the Chancellor of the Exchequer on Thursday week whether each hereditament separately numbered, described, and valued in the valuation list, as finally determined by the Assessment Committee under the Valuation (Metropolis) Act of 1869, should, if such hereditament were chargeable to the inhabited house duty, be assessed separately for such duty, in conformity with such valuation list, and in pursuance of section 45, sub-section 2, of such Act.—The Chancellor of the Exchequer: No, sir. I think the conclusion does not necessarily follow, when the House Duty Act requires that the assessment should be made jointly. The fact that the valuation must be separately made under the Metropolitan Valuation Act does not interfere with the provisions of the Act regarding such joint assessment. The assessment could be furnished upon the sum of the valuation under the Metropolitan Valuation Act.

THE NEW LAW COURTS.—Mr. C. Bentinck asked her Majesty's Government whether it was their intention to authorise the expenditure of public money in the execution of the design for the Strand front of the new Law Courts, which was now exhibited by Mr. Street at the Royal Academy.—Mr. Ayrton said the designs for the new courts were not approved of by him, but by the Lords of the Treasury. Since the sketch designs were approved of, Mr. Street had intimated that he had made some small changes in the elevation of the Strand; but the nature and extent of those changes could only be perfectly ascertained when he had deposited the regular contract plans for the elevation of the building. The design which was exhibited at the Royal Academy was not really an elevation, but merely a perspective drawing of the plan which Mr. Street had in view at the time when he drew it. At present it was impossible to judge what would be the nature and extent of the real elevation, but the matter would be taken into consideration when the regular contract plans were deposited.

THE HOUSES OF PARLIAMENT.—Mr. Butler-Johnstone on Tuesday asked the First Commissioner of Works whether it was a fact that in August, 1870, seven different preparations for preserving the stone were tried upon the Houses of Parliament; and, if so, whether any report as to the relative merits of those preparations had been issued; whether it was a fact that, with one exception, all those preparations had failed; and whether there would be any objection to mark those several experiments with numbers, with a printed reference to the names of their respective inventors, for the information of members and others viewing them.—Mr. Ayrton stated that in 1870 several experiments were made for the preservation of the stone, but sufficient time had not elapsed for a satisfactory report to be made as to the success of those experiments, and he did not think it desirable to afford any information which might be converted into an advertisement by the different parties. If any one really interested in the matter desired accurate information there would be no difficulty in ascertaining it on application to the proper authorities.

THE NEW POST-OFFICE BUILDINGS.—Mr. Winn asked the First Commissioner of Works whether he intended to hold the contractors of the new Post-office buildings to their engagement, in the event of their being unable to fulfill their contract within the specified time, owing to the strike now existing between the builders and their workmen.—Mr. Ayrton said the contract was to have been completed on the 31st of December last, but for various reasons the time had been extended. At present there was no question before the Board. When the building was completed questions would arise as to whether the work had been unduly delayed, with reference to the terms of the contract, under which penalties of a certain sum per week were specified. When the proper time arrived inquiries would be made into the matter, to ascertain whether the penalties ought to be enforced, and all the circumstances would then be taken into account.

BIRMINGHAM SEWERAGE BILL.—In the House of Commons, on Monday, Mr. Dixon presented a petition from the Corporation of Birmingham praying for redress for the rejection of the Birmingham Sewerage Bill.

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WATER SUPPLY AND SANITARY MATTERS.

BURNTISLAND.—It has been resolved, on the basis of a report submitted by Mr. John Sang, C.E., Kirkcaldy, to probe the Widows' Land at the base of the Binn Hill at Burntisland, with the object of extracting water from the shale beds that are believed to abound there.

IMPURITY OF THE METROPOLITAN WATER SUPPLY.—Dr. M'Cormack, the medical officer of health for the Lambeth district, submitted a report of considerable length to the Lambeth Vestry at their meeting on Thursday week, in which some grave remarks are made as to the impurity of the water supplied by the Lambeth and Vauxhall companies. The report stated that on the 18th of June he examined the water of both companies, with results showing that whilst there was but a very slight improvement in the water supplied by the Lambeth Company, that of the Vauxhall Company continued to exhibit the same degree of impurity as it did the previous month. Living organisms were detected by the microscope in both waters, and in the Lambeth water animalculæ were found visible to the naked eye. The specimen was that known as the "water scorpion." After showing that the health of the prisoners in Millbank and the rate of mortality at once strikingly improved and continued on the water supply being changed from the Thames to that from the artesian wells in Trafalgar-square, and that the same results were shown at Pentonville, where the water was drawn from a well deep in the chalk, the report went on to state that, in the opinion of the medical officer, if it were wished to attain to a higher standard of health and a lower rate of mortality, our water supply should be obtained from pure sources, and not be subjected, as was now the case, to contamination from sewage, and that its comparative purity should not be dependent on the state of the weather. The report concluded as follows:—"It is, I fear, too true a saying that our criminal population are better cared for, and their health of greater consideration, than that of our hard-worked honest poor. This state of things should not be allowed to continue, and I think it is now incumbent on not only this vestry, but every vestry in London, to bring this matter of the impurity of the water supply under the notice of Government." Mr. Fowler gave notice that at the next meeting he should move that a deputation be appointed to wait upon the Home Secretary on the subject.

"POISONING AN ARCHBISHOP."—At the Lambeth Vestry last week, letters from the Home Office and the Local Government Board were read, enclosing a complaint from the Archbishop of Canterbury with regard to the nuisance and damage arising from two large potteries near Lambeth Palace. The air being charged with muriatic acid, the healthful growth of trees was impossible, shrubs on the Embankment had their leaves literally coated, as with varnish, and the limestone of which the Palace was built was fast crumbling to decay. It was resolved to direct the medical officer to inquire and report on the steps the vestry could take to abate the nuisance, one of the speakers expressing grave doubts whether anything would be done "until the archbishop and all his family had been poisoned."

TUNBRIDGE.—Sewerage is to be gone on with at Tunbridge, plans having been prepared by Mr. C. Jones, and approved by the Board of Health. Seven tenders for carrying out the works have been submitted, of which the lowest, £7,211, is £3,033 4s. 9d. less than the highest! At West Moulsey, the same startling disproportion is observable, on a reduced scale, between the highest and the lowest of four tenders for the construction of some 420ft. or so of 30in. ring sewer, and a sediment tank, at the Grange, Messrs. Scase, offering to do the work for £100, and Messrs. Hibbins & Trasler, for £174—very nearly double! In this case, however, the accepted tender was for £162, and as it appears the owner of the estate is a private person, it is hardly probable, the *Parochial Critic* thinks, that he deliberately loses by the transaction.

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CHIPS.

New Schools were opened at Chartham, Kent, on the 27th ult. Mr. J. G. Hall, of Canterbury, is the architect.

Church restoration is going on at Weekley and Warkton, Leicestershire. The latter church underwent a very thorough renovation, as to its internal fittings and arrangement, only four or five years since. It is now intended to carry the work further. Amongst other improvements, the south aisle will be enlarged, a vestry added, and the present unsightly windows replaced by others. Mr. Slater is the architect. At Weekley, besides many other alterations, the church will be reseated throughout, the pews and gallery having disappeared. The works are under the superintendence of Mr. Blomfield, who is also building new parsonage-houses both here and at Little Oakley.

The land on the Holborn Viaduct, of which mention was made in last week's BUILDING NEWS as having been let for £15,000 a year has been taken by Mr. Richard Tress. The area is 114,000ft., not 120,000ft., as previously stated.

A new Episcopal Church was opened at Moffat, N.B., on Sunday last. The plan of the building is cruciform, and consists of chancel, vestry and organ chamber, with transepts and nave, the latter 55ft. by 22ft., and the interior apex of the roof 28ft. in height. Beyond the nave is a porch with two doors. In the chancel over the altar is a tripartite filled in with designs by Mr. Ballantine, Edinburgh.

The memorial stone of a new Baptist Chapel is to be laid at Addlestone to-day. Mr. Wonnacott, of Chertsey, is the architect. Mr. Spurgeon is to deliver a sermon in connection with the ceremony under the famous Cross Oak, under which the Lollards and Wycliffe are said to have preached.

An aquarium is about to be constructed near the Alexandria Park, Manchester. Mr. J. Sherwin is the architect.

Our Office Table.

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A STRANGE HOTEL.—Of all the hotels in the world the very oddest is a lonely one in California, on the road between San José and Santa Cruz. Imagine ten immense trees standing a few feet apart and hollow inside; these are the hotel, neat, breezy, and romantic. The largest tree is 65ft. around, and contains a sitting-room and that bureau of Bacchus wherefrom is dispensed the thing that biteth and stingeth. All about this tree is a garden of flowers and evergreens. The drawing-room is a bower made of redwood, evergreens, and madrona branches. For bed-chambers there are nine great hollow trees, whitewashed or papered, and having doors cut to fit the shape of the holes. Literature finds a place in a leaning stump, dubbed "the library." If it were not for that same haunt of Bacchus, it is certain that the guests of this forest establishment would feel like nothing so much as dryads.

THE CHARING-CROSS APPROACH TO THE THAMES EMBANKMENT.—At the usual weekly meeting of the Board of Works on Friday last, a letter was read from the Duke of Northumberland asking the Board to submit to him a full statement of their case and plan for an approach to the Embankment through Northumberland House, in order that he might transmit the same to his legal advisers. The Works Committee presented a report stating "That a direct approach from Charing-cross to the Thames Embankment being imperatively required for the public convenience, the Board do apply to his Grace the Duke of Northumberland, with the view of ascertaining whether he would assent to the introduction of a Bill by the Board for the acquisition of Northumberland House and grounds, and such other portions of his property as may be necessary for the formation of the approach." The solicitor stated that the engineer's estimate for the work was £206,000. After some further discussion the report was unanimously adopted.

METROPOLITAN ASSOCIATION FOR IMPROVING THE DWELLINGS OF THE INDUSTRIOUS CLASSES.—A meeting of the shareholders of this Association was held at the offices, Finsbury-circus, last week, under the presidency of Lord Claud Hamilton, M.P. The report showed that, though the buildings of the Association were over one thousand to the acre (being four times that of crowded and unhealthy neighbourhoods), yet the mortality was only two-thirds, in consequence of the vast open spaces around them, and the improved construction of the buildings. The directors had just entered into an agreement with the Metropolitan Railway Company to take a large piece of land in the Farringdon-road, lying between Hatton Garden and Clerkenwell, upon which they proposed to erect dwellings for about 250 families. The 164 Alexandra cottages at Penge were let. The profits for the year amounted to £5,414 4s. 3d., from which a dividend of 4½ per cent. per annum, free of income-tax, will be paid, leaving a balance of £451 8s. to be carried to the Guarantee Fund, which will then amount to £5,488 4s. The Chairman, in the course of his remarks on the report, said that with reference to the dwellings at Penge there seemed to be but one thing needed—viz., an increase of trains, which the railway directors could not yet be induced to put on.

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At the Clarence Hotel, Manchester, on Thursday, the 4th inst., Mr. T. Acton, auctioneer, sold 861 superficial yards of land in Cross-street and S. Ann's-street, Manchester, together with the buildings thereon, which latter produce a gross rental of £1,811. The bidding commenced at £40,000, the property being ultimately knocked down at £55,600 to Mr. R. Bridgford, estate agent.

The Town Hall Committee of the Bolton Corporation have accepted the tender of Mr. Simpson, of London, amounting to £5,300, for the decoration of the Great Hall, Council Chamber, Mayor's Reception and Dining Rooms, entrance hall and corridor in the Town Hall at present being erected in Bolton.

Messrs. Hodkinson & Clarke, the manufacturers of the new sheet iron Venetian blinds, have been occupied during the last six months in the erection of new premises at Small Heath, Birmingham.

Dick Whittington's statue, erected where he heard, like Irving, "those bells," has been removed and sold to a publican, who has had Dick stuck up over his door at Highgate, and repainted.

At Lawrence, Massachusetts, a machine for making wall-paper produces 79 miles of paper daily, being run 23 hours.

The Fine Arts Exhibition at Brussels will open on the 15th August, and close on the 15th October next.

Trade News.

WAGES MOVEMENT.

London.—The men are no longer united among themselves, and the masters have practically obtained the advantage. On Wednesday night week the London Society of Masons resolved upon sending a deputation to the masters to treat for the termination of the strike and lock-out, and the interview took place on Friday, when the following treaty was agreed upon:—"The Committee of the Central Association of Master Builders agree to settle the questions now pending between them and the masons by their representatives in the following terms: That the average working hours shall be 51 per week, as requested by the workmen, but that the shorter hours during which they cannot see to work in the winter shall be made up by additional hours in summer; and that the wages shall be 8½d. instead of 8d., as at present. The hours to be as under: 12 weeks in winter at 47 hours per week, the 40 weeks remaining at 52½ hours. The hours of commencing to be 6 o'clock in the summer, 7 in the winter. In winter, half-an-hour later on Monday morning. The hour of leaving off on Saturday to be 12 o'clock all the year round. The Committee of Masters will recommend the members of the Association to pay wages on Friday evening after work.—Signed for the masters, B. Hannen, C. Lucas, G. Trollope, G. Dines, S. Bird. For the men, H. Broadhurst, H. Nisbet, W. Bowman, M. Kennard, P. Weighill." Secresy was enjoined until such time as they could be submitted for acceptance or rejection to the general body of masons. The Carpenters' Committee obtained no official intelligence of the negotiations until Saturday morning, when it was conveyed to them in a secretarial letter. The carpenters were greatly incensed by the receipt of this communication; no settlement, they contended, ought to have been entertained without their being parties to the compact; and, with these feelings, the meeting of the two committees may be readily conceived. The Masons' Committee were upbraided for breaking faith with the carpenters, but Mr. Broadhurst is understood to have protested that he never supposed the masons could be expected to act alone; on the contrary, at their first mass meetings, he distinctly stated they had made overtures to the masters for a compromise, while at the second of those meetings, when it was proposed "the men should not resume work until the nine hours and ninepence, pure and simple, were conceded," he moved and carried an amendment that they should not go back "until the dispute was settled." At 8 o'clock on Monday a special meeting of the carpenters' central committee was held for the purpose of considering the course to be adopted in the present crisis. Mr. Matkin, the secretary, read the notice received from the masters, announcing that the shops would be re-opened on Tuesday morning upon the terms accepted by the masons. After some discussion it was resolved that a special delegate meeting be held on Tuesday evening, at 8 o'clock, when the question to be placed before the delegates should be, "Shall the carpenters and joiners resume work upon the terms accepted by the masons, or shall they adhere to the terms of their memorial, nine hours at 9d. per hour, accompanied by a code of working rules, to be mutually agreed upon by the masters and workmen?" At 2 o'clock the same day a general meeting of the men on strike from Jackson & Shaw's and Brass's firms was held at the Brown Bear, Bloomsbury, to discuss the present position of the dispute. After some discussion, a resolution was proposed and carried by an overwhelming majority, condemnatory of the agreement with the masons, and declaring adherence to the terms of the memorial. The meeting of the locked-out men in the Pimlico district was also held, when a resolution similar to the above was unanimously adopted. A crowded meeting of the delegates from the carpenters and joiners was held in the evening. Mr. Sinclair moved the following resolution:—"That this meeting of delegates from the carpenters and joiners of London desires to express its great regret at action taken by the London masons, and is of opinion the arrangements entered into between the masters' committee and the masons' deputation are calculated to frustrate the objects contained in our memorial of the 1st of March. That we are further of opinion we should continue our combined efforts to obtain the objects of our memorial, believing that no other terms are likely to remove the long-standing grievances in our trade." The resolution was strongly supported by several delegates, and, on being put from the chair, was carried unanimously. Mr. T. Davis moved the second resolution—"That this delegate meeting earnestly calls upon all carpenters and joiners who value the object sought for by our memorial to abstain from resuming work in any shop, or at any job, on strike, where the lock-out has existed, until the terms of the memorial are conceded by the employers, or such other terms are offered by them as, in the opinion of the trade, may form a just and equitable settlement of the points in dispute." Other delegates supported the resolution, which was then put and carried unanimously. Mr. Barry, moved the third resolution:—"That in the opinion of this meeting it is desirable to hold a mass meeting of the men in all the branches of the building trade represented at the conference last Monday—viz., the carpenters, bricklayers, plasterers, painters, smiths, metal workers, and labourers, to promote combined action, and that our delegates be empowered to co-operate in getting up such meeting at the earliest opportunity." Mr. Sydenham seconded the resolution upon the understanding that the masons should be excluded from such meeting. "That the two first resolutions be printed and circulated through the trade with a list of those firms appended where men were not to apply for work." One of the auditors then reported that the total amount received by the treasurer up to Saturday last in aid of the movement had been £2,426 16s. 3d., and the sum expended was £1,905 12s. 4d., leaving a balance of £521 3s. 11d. This, of course, did not include the strike pay paid by the various societies to their members. A deputation from the plasterers was then introduced, and were informed of the resolutions which had been passed during the evening, and they expressed much satisfaction at the result, promising the co-operation of their body. As soon as the result of the delegate meeting of carpenters held on Tuesday night became known throughout the metropolis, the resolutions passed received the cordial approval of nearly all the district committees whose delegates had been at the meeting. Not only did the carpenters applaud the determination which had been come to by the central committee, but the members of the other trades, with the exception of the masons, gave a pretty general assent to the action taken by the carpenters, and as far as can be learnt there is every reason to suppose that the carpenters will be supported by the bricklayers, the plasterers, the smiths, and the members of the other trades concerned in building operations. Some dissatisfaction is also apparent among a section of the masons, who, while not denying that their trade must derive some benefit from the compromise, aver that it would have been far better had the interests of all the trades been consulted, and all hands determined to stand or fall together. Owing to this division of opinion the masons have not all resumed work, though many have gone on to outside jobs of Messrs. Cubitts', Trollope's, Lucas's, and Hannens'. The plasterers on Wednesday sent in a communication to the Master Builders' Association, asking them to receive a deputation with the view of discussing the basis of an amicable settlement, as applicable to the requirements of their branch. The tone of the men, generally, is conciliatory, and, like the masons, they defend the advsiability of independent action on the ground that if there had been a joint discussion with the view to concerted action, each branch would only have struggled for its own particular interest, and that an amicable settlement would have been retarded. The terms of the communication which they have sent in they do not wish to make public till it has been discussed, but they express themselves anxious for a fair adjustment. A special meeting of the trade is about to be called for the purpose of remodelling the Plasterers' Society. The object of the meeting will be to form the London branch on a more independent footing. Hitherto their rules have been similar to those of the masons, one of the principal being that on any question the votes of the members of all the branches throughout the country must be taken. In consequence of this, on many important questions the country votes negatived those of the London men, and thus it is argued that the Londoners have not a fair representation, and that the system requires amendment. At a conference held on Wednesday, at the Westminster Palace Hotel, by the committee of the Central Association of Master Builders and the representatives of the provincial towns, as under—Mr. Briggs, president General Builders' Association; Mr. Urmson, of Liverpool, Mr. Neill and Mr. Johnson, of Manchester, Mr. Beckett, of Northwich, Mr. Gibson, of Warrington, Mr. Hardwick, of Birmingham, Mr. Simpson, of Hull, Mr. Bennett, of Rugby, Mr. Marriott, of Coventry, Mr. Baker, of Bristol, Mr. Clutterbuck, of Gloucester, Mr. Faucett, of Huddersfield, Mr. Bell, of Cambridge, and Mr. Mault—the following resolution was passed:—"That it is desirable that the Association of Master Builders in the United Kingdom should enter into a close alliance with a view of ameliorating the position of the trade, and especially in regard to the labour question to endeavour to settle matters without a resort to the system of strikes now so frequently occurring. That in constituting a central association it is desirable to make such arrangements as shall secure united action where united action is necessary, and at the same time shall secure to the various associations independence of local action in all local matters.

Norwich.—On Friday evening last the journeymen bricklayers of Norwich held a meeting to consider their present rate of wages, and to agitate for the nine hours' system. It was resolved that they should request an advance of one halfpenny per hour, a reduction of the hours of labour from 60 to 56 hours per week, the week's work to finish at one o'clock on Saturday; that all overtime be charged a penny an hour extra; and that the system of sub-contracting and jobbing by workmen be abolished.

TENDERS.

Appleton-upon-Wiske.—For new schools, Appleton-upon-Wiske, for the School Board:—

Pattison	£273 0 6
Peacock (accepted)	255 18 0

Berks.—For new schools and master's residence at Stanford-in-the-Vale, Berks. Mr. William Penstone, architect:—

Wheeler	£1254
Newcombe	1228
Bartlett	1189
Honor & Castle	994
Williams (accepted)	932

Cambridge.—For the erection of two villas (exclusive of sand, lime, and bricks). Mr. Edwin Bays, architect, Cambridge and Bury S. Edmunds:—

Wilson & Son	£1080
Bell & Sons	970
Clarke	920
Tiplady	845
Thoday	790

(Sharp, too late.)

Caterham.—For detached house in Harestone Valley, Caterham. Quantities supplied by Mr. F. Sparrow:—

Williams & Son	£1854
Taylor & Son	1750
Bridgman, Nuthall, & West	1665
Ward	1661
Jarrett	1639
Smethurst (accepted)	1635
Architect's estimate	1646

Chesterfield.—For the erection of new school in Hipper-street, for the School Board:—

Heathcote (accepted)	£1634 10 0

Chesterfield.—For the erection of new school in S. Helen's-street, for the School Board:—

Forrest (accepted)	£1819

East Acton.—For alterations and repairs at "The Lodge," East Acton:—

Hill	£629
Cooke & Green	518
Harris & Wardrop (accepted)	319
Purkiss	310

Hackney.—For the conversion of a warehouse in Claremont-street, Hackney, to the purposes of a school, for the London School Board:—

Parsons Brothers (accepted)	£1799

Kenley.—For a detached house at Kenley, Surrey. Mr. Richard Martin, architect:—

	House.	Felting roof.	Total.
	£	£	£
Walkey	1650	27	1677
Wright Bros. & Goodchild	1150	55	1205
Jarrett	1150	50	1200
Simons	1113	37	1150
Smethurst	1050	46	1096
Ward (accepted)	989	48	1037

Kenley.—For the erection of a detached house at Kenley, Surrey:—

Ward (accepted)	£600

Leamington.—For residence, stabling, and lodge, near Leamington, for Henry Ellis, Esq. Messrs. Payne & Talbot, architects. Quantities by Mr. Thomas Mansell, Birmingham:—

Hardwick & Son	£6820
Jeffery & Pritchard	6752
Smith	6670
Horsley Brothers	6587
Mason & Mills	6392
W. & J. Webb	6215
Parnell & Son	6079

Liverpool.—For offices and stables for the executors of the late J. M. Threlfall, Esq., Brewery, Liverpool. Mr. G. Scamell, Great George-street, Westminster, architect. Quantities by Messrs. Curtis & Son:—

	Offices.	Stables.
Holmes & Nicholl	£3991	£2935

Sevenoaks.—For the erection of a house for T. Usborne, Esq., at Godden-green, near Sevenoaks. Mr. Joseph Fogerty, architect, Westminster-chambers, S.W.:—

Trollope & Son	£5876
Browne & Robinson	5496
Foster	5377
Anscombe	5376
Dove	5300
Bayes & Rimage	5220
Colls & Sons	5118
Perry & Co.	4775
Punnett & Son (accepted)	4582
Powell	4350

Stables, groom's residence, and outbuildings.

Punnett & Son (accepted)	£1272

Standon.—For the erection of a new girls' school, and alteration to boys' and master's residence at Standon, Herts. Mr. G. E. Prickett, architect:—

Whitaker & Sons (accepted)	£728
Thurgood	695

Yorkshire.—For alterations and additions to Carlton Hall, Yorkshire (Contract No. 2), for Lord Beaumont. Mr. E. Welby Pugin, architect. Quantities supplied by Mr. R. Ovenden Harris:—

Peto Brothers	£14540
Lucas Brothers	14250
Haigh & Co. (accepted)	13890

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THE BUILDING NEWS.

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LONDON, FRIDAY, JULY 19, 1872.

THE VILLAGE CHURCHES OF DENBIGHSHIRE.[*]

SOME further portions of this work, by Messrs. Lloyd-Williams & Underwood, architects, of Denbigh, have been forwarded to us. We reviewed the first part at some length in our journal for December 1, 1871, and commended the idea and method of its execution, but found some cause for objection as to minutiæ, such as insufficient elucidation of the jointing of the stonework of the examples illustrated. We are glad to find that the authors took the hint in good part, and applied themselves to amend in this particular the remaining plates in their volume. They state that they have often found great difficulty in ascertaining the exact original joint lines of masonry, owing to rebuildings and repairs, and to thick coats of plastering and whitewash, which it is not always practicable, if desirable, to remove for the purpose of dissecting the construction beneath; we have, therefore, all the greater reason for being thankful to them for having made it their endeavour to give the drawings with the greatest possible accuracy. The present instalment of the work is not inferior in point of interest to its predecessor, and we will follow out the plan we adopted in our former notice of touching in order upon such of the plates in the series as seem to call for special attention. The character of the sketches in perspective is generally weak and ineffective, and detracts from the artistic value of the work. The fine church at Gresford has its plan and sections given in plate 12A, and various details from it are shown in the next five plates. The body of the church is a simple rectangle of 103ft. by 60ft. internal dimensions, comprising nave and chancel without structural break, and side aisles; attached is a projecting massive western tower and a south porch. The architectural details of the masonry throughout are somewhat poor Late Pointed, though some parts seem of the Transition period between Flowing Decorated and Perpendicular. The roofs are very flat, and hidden externally by battlemented parapets. In construction and decoration internally they are fine. Though not exactly tie-beam roofs, they have but little more rise than might be obtained in such, the principal rafters butting against each other obtusely—and in the nave being much deeper in the centre where they join—and curved braces and wall-pieces at the sides. The purlins and rafters are massive and richly-moulded, and intersect with carved bosses in an elaborate manner. A recessed altar-tomb, with recumbent figure of a knight in chain armour, under one of the south aisle windows, and a highly enriched sepulchral slab in the north aisle, are well worth notice; but the treasure of the interior is its fine chancel screen, which is in a remarkably good state of preservation, although, unfortunately, some portions of it have been repaired in cast iron! This screen divides off from the nave the three easternmost bays, two of which are used as chancel with returned stalls and altar space, but are again separated from the third, which is left as a passage way behind from aisle to aisle, and two bays only of the aisles are included within the screen, which consequently is returned in a picturesque manner, as shown by a perspective view. The advanced portion facing the nave is much richer than the rest, with semi-circular arches fringed with delicate cusping, and the spandrels are groined, corbelling forwards to support the wood beam. The tower has a remarkable parapet, with angular and central pinnacles on each side, and statues in the intermediate spaces.

The beautiful village of Llanwrst and its screen is the subject of plate 18 and three other plates. It is a smaller and aisleless structure with western tower, south porch, and memorial chapel to the Gwydir family on the same side. In this chapel are two objects of great interest: the effigy of a knight in plate armour, supposed to be Prince David, the natural son of Llewelyn the Great, and a sarcophagus, the sides of which are covered with a continuous tracery of quatrefoils, which is said to have held the body of Llewelyn himself. An inscription within it declares: "This is the coffin of Leolinus, Prince of Wales, who was buried in the Abbey of Conway, which upon the Dissolution, was carried here." The upper part of the screen, which extended across the church and formed the division between nave and chancel, remains in good preservation; it is rich, but florid and late in detail. It had twelve narrow arches, the heads of which are filled with fantastic flowing tracery. The gallery of the rood loft above, with twenty-one narrow openings divided by coupled buttresses, terminating in a fringe of pinnacles, still exists, and the hollows of the cornices have elaborately-carved foliage in them. A good piece of wrought metal work is preserved in Llanarvon Church. This is an ancient brass candelabra, which has the central portion formed like a monstrance, with a figure of the Blessed Virgin within it, outside which are three tiers of branches to hold the lights. This church also boasts a good altar tomb of the fourteenth century, with a recumbent effigy of a knight in chain armour, with considerable remains of colouring still remaining. The face was pink, the eyes blue, the armour steel colour, the surcoat crimson, the shield gold and red, and the inscription around was in raised gilt letters, upon a greenish blue ground. Another good and tolerably perfect screen and rood loft from Derwen are shown in plates 27, 28, and 29, and also a curious churchyard cross with rude sculptures of the Crucifixion, Justice, Charity, and Virgin and Child, which are just distinguishable.

An old wooden font in Efenechtid Church is a remarkable curiosity. Llangollen Church has a highly-enriched hammer-beam roof, with panelled ceiling curiously diapered between the principals; and Ruabon Church contributes a quaint ancient wall painting, discovered during recent repairs. The date is fourteenth century, and it is in a good state of preservation. It is 15ft. 2in. long by about 5ft. 3in. high, outlined in red, and coloured partly in red and partly in yellow. The composition is wonderfully good for the period, but the drawing very rude. The subject is obscure. Ten figures are represented in varied and interesting costumes, with six angels. The latter seem to be directing, apportioning to the former their future habitations, according to their respective virtues and vices, among which usury, wine-bibbing, love of dress, &c., are distinguishable.

Plate 42, from the Abbey at Denbigh, gives in detail a very curious five-light thirteenth century window (restored in the drawing). The mullions are doubled in their depth, with a web of stone between them, perforated by two ranges of small arched openings, an arrangement which must be picturesque in perspective. The sedilia in the same building is treated in a somewhat similar manner. As the authors inform us that they are now engaged in illustrating in a separate form on a larger scale Denbigh Castle and Vale Crucis Abbey, which contains some exquisite details, together with Wrexham and Ruthin Churches, the tower of the former of which is a wonderfully fine specimen of Perpendicular work, and that they think they will then have exhausted everything of architectural interest in the county as regards Gothic buildings, we presume the present work has now been completed. We have before us some specimen plates of this fresh undertaking, including the perspectives of the Burgesses Tower, and the very grand gateway of the Castle. In this we note that the masonry has been most carefully delineated, and every stone put in accurately. The mixture of freestone and limestone, the latter in parts in very small pieces, looks like tesseræ. The gateway consists of two round towers, rising from square bases with fine squinches running nearly to the top of what remains; but above where they finish the masonry is arranged in an effective band of alternate large blocks of freestone and squares of small limestone, making a good feature. This drawing we can commend in many ways, except as to its accessories, the principal one of which is irresistibly ludicrous. It is the ghost of a figure of a knight in full armour, hastening frantically from the dilapidated ruin, which he doubtlessly knew in its prime, and his legs, such as he has, are giving way beneath him. *Requiescat in pace*, is our advice to the authors. To expunge him entirely and redraw the almost as absurd trees in the background would greatly add to the merits of this illustration. An old headless statue, seated in a very interesting niche over another gateway of Denbigh Castle, is equally poorly drawn, and while there is time should be re-executed; in fact, we wish we could pronounce the artistic quality of the work to be equal to its general conception and careful geometrical detailing. Nevertheless, we can congratulate the authors upon the generally creditable carrying out of their design, and can recommend it to the profession as a work which at a most moderate cost provides a varied and interesting collection of details from a locality which is not so well known as it deserves to be by architectural students.

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NOTES ON EARTHWORK.—XI.

IN constructing waterworks on the gravitation principle, it is often not possible to avoid tunnelling through intervening hills which rise much above the gradient level of the line of conduit. These tunnels are never very large, and rather resemble the headings of large tunnels, being seldom more than 5ft. or 6ft. high, and 4ft. or 5ft. wide in the clear. The first tunnel of this kind that we will mention is 1710 yards in length, 4ft. 9in. high, and 3ft. 6in. wide in the clear of the masonry, which is 1ft. thick. This tunnel was driven through the strata of the lower lias, consisting of dark laminated clays and bands of gray limestone, with partings of shale. The clay was of that sort that swells on exposure to the atmosphere. The timbering in a part of one of the shafts was crushed in by this swelling, and caused considerable delay. Many other cases of the swelling of the ground on exposure to the air have occurred. A well sunk at Richmond in the formation known as the London clay, which fills up the chalk basin under London, was wholly filled up in one night from this cause. There is a distinction to be made between the swelling of ground by its exposure to the air, and the growing up of the floors of headings left open for a long time, as in coal workings, where the weight of earth above mechanically forces up the floor. These latter instances may or may not be accompanied by the effects of the former cause, which appear to be due to a chemical action between some of the properties of the atmosphere and some of the constituents of this kind of earth.

On the waterworks tunnel above-mentioned, 1710 yards in length, there were 7 shafts, of which the deepest was 150ft., and the average 105ft., the aggregate depth being 245 yards.

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[*] The Village Churches of Denbighshire. Illustrated by Perspective, Geometrical, and Detail Drawings by LLOYD WILLIAMS & UNDERWOOD, Associates R.I.B.A., Denbigh. Published by the Authors, at Denbigh. Printed by A. Macgregor, Liverpool.

The estimate of the cost of the tunnel was as follows :—

	£
Sinking shafts, 245 lineal yards, at 80s.	980
Driving tunnel, 1710 lineal yards, at 50s.	4275
Masonry lining, 1710 lineal yards, at 34s. 3d.	2907
Steining permanent shafts, 612 cubic yards, at 19s...	581
	8743
Contingencies, 10 per cent	874
	9617

$\frac{£9617}{1710}$ = £5 12s. 6d. per lineal yard.

The shafts were excavated 8ft. square, elm poling boards 1½in. thick being inserted behind settings of round timber averaging 8in. diameter, set 5ft. apart. The tunnel was excavated of the form of an egg with the small end upwards, the lower part being slightly flattened, as in Fig. 13.

With this shape, and working in short lengths, the ground stood in some parts without timbering. The headings from each shaft were kept in line by suspending plumb bobs attached to two silk cords accurately aligned with the transit instrument on the top, and driving spikes with holes in the heads into the timbers of the roof of the heading at the bottom of the shafts, from which candles were suspended from time to time, into the line of which one of the miners brought his own candle at each face of the work. Further on other spikes were driven in a similar manner, and the whole verified by the engineer from time to time.

The proper depth of each shaft having been measured down from a bench mark at the top, with wooden rods having brass sockets and screwed ends, and another bench mark having been made at the bottom, the levels of the tunnel, which had an inclination of 1 in 1056, or at the rate of 5ft. in a mile, were carried forward towards the meeting of each pair of headings by the use of the dumpy level, but as there is not room for the ordinary legs of the instrument, a special set of short legs were made, and the levels carried forward from the bottom of the shaft. It is, of course, an anxious time when two headings are known to be near the meeting point, to ascertain how nearly in line and level the two meet. Stories have been told, founded more or less on fact, of two approaching headings not meeting at all, but the opprobrium of such a thing is so great on all concerned that it seldom happens. Public opinion is a very rough form of justice, but it contains an element of truth sometimes, and to have such a mishap as any great divergence in line or level of two approaching headings, shows simply one thing—carelessness.

	£	s.	d.
During fourteen weeks, from Sept. 15, to Dec. 29, there were 277 lineal yards of tunnel driven, which, at 50s. per lineal yard =	£692	10	0
There were 98 cubic yards of extra excavation in rock, at an agreed price of 12s. 6d. per cubic yard =	61	5	0
And 1,120 cubic yards of masonry set, cost 19s. =	1,064	0	0
	£1,817	15	0

Besides this amount of work the following materials were brought upon the ground :—

910 cubic yards dressed stone from the quarry.
108 loads of lime.
113 loads of smith's ashes.

During these 14 weeks the following number of days' work were done :—

Miners	2996	Smiths	170
Labourers	1894	Carpenters	180
Stone-cutters	1559	Sawyers	32
Masons	853	Carters	1782
Horses	1668		

For this labour about £2,000 must have been paid, so that the work would not seem to have been very profitable at the estimated prices. The stone-cutters include those dressing stone at the quarry, as well as those on the ground, and the horses include those hauling stone from the quarry, lime, and ashes, as well as those winding at the shafts.

Another tunnel, in the Kimmeridge clay, consisting of a dark coloured clay, shale, and "stone coal," 5ft. high and 3ft. 6in. wide in the clear of the masonry, which was 12in. thick, the length being half a mile, and there being two shafts each 160ft. deep, was let at the following prices :—

Sinking shafts in earth not exceeding 100ft. deep	40s. per yard down
Sinking shafts in earth from 100ft. to 200ft. deep	45s. "
Sinking shafts in rock not exceeding 100ft. deep	50s. "
Sinking shafts in rock from 100ft. to 200ft. deep	55s. "
Excavation of tunnel in earth	37s. per lineal yard
Excavation of tunnel in rock	50s. "

A great deal of foul air was met with in this tunnel.

One of the most difficult waterworks tunnels ever driven, probably, was through a hill of conglomerate rock. The difficulty was that the rock consisted of excessively hard boulders naturally cemented together, and when the drill had penetrated a few inches it mostly happened that it alighted upon the side of a boulder, and further progress with that hole could not be made. When the drill happened to alight on the centre of a boulder it could be got through, but these fortunate cases were comparatively few. In the other cases the drill had to be shifted by guess to a more favourable spot, but often with the same result, of striking the side of a boulder. The open cutting at each end of the tunnel was gravel and fissured rock, and the loose ends of the tunnel the same for a part of their length. In approaching this tunnel the water was conveyed in a covered stone conduit, 4ft. 8in. high and 3ft. 6in. wide, and a certain length of this conduit at each end of the tunnel was let with the tunnel in the same contract. The length of the tunnel was 2120 yards. There were 9 shafts, varying from 50ft. to 100ft. deep, and for an average depth of 16ft. down the ground was loose. The individual depths of this kind of ground, however, varied from a few feet to 40ft. in the various shafts.

Below this loose ground it was rock. The contractor to whom the tunnel was first let failed to carry out his contract after sinking all the shafts, and driving a length of 749 yards of tunnel. He was thereupon paid off on the following statement :—

	£	s.	d.
803 cubic yards excavation of earth in open cutting at 1s.	40	2	0
3,521 cubic yards excavation of rock in open cutting at 7s.	1,232	7	0
2,988 cubic yards excavation of rock in tunnel at 16s. 6d.	2,465	2	0
47 lineal yards excavation of earth in shafts at 30s.	70	10	0
174 lineal yards excavation of rock in shafts at 85s.	740	18	4
848 cubic yards masonry in shafts and tunnel at 28s. 6d.	1,208	8	0
192 cubic yards rubble masonry and tunnel at 12s.	115	4	0
43 cubic yards broken stone and tunnel at 1s. 9d.	4	3	7
1,061 cubic yards clay puddle and tunnel at 2s. 6d.	132	12	6
20 lineal yards 30in. pipes laid and jointed at 10s.	10	0	0
	£6,019	7	5

These latter items are not directly concerned in the subject of earthwork, but we give them for the sake of comparison with what we shall have to say presently.

The proprietors took the plant of this first contractor at a valuation of £370, and, until the work could be relet, carried it on without the intervention of a contractor. This was a kind of ground that the miners and colliers of the neighbourhood were neither of them accustomed to work in, and although the contractor to whom the work had in the first instance been let was a Cornishman, he was either unable or unwilling to procure men for the work who understood the nature of such ground. But being a Cornish man he probably saw, some time before he took his measures to be released from his contract, that to drive a small tunnel through it would be very difficult and slow work. However that may have been, the following statement of progress during 12 days and nights—that is to say, 20 out of the 24 hours—will afford, to any one who will reckon it up, some idea of the wages earned at the prices per yard set forth. The lengths driven were reckoned at per fathom (6ft.), but they are

FIG. 13

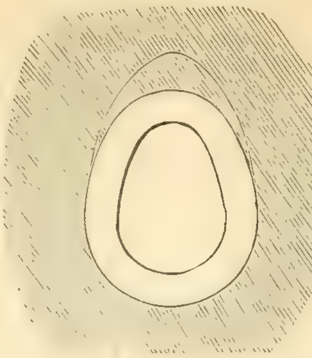


FIG. 14

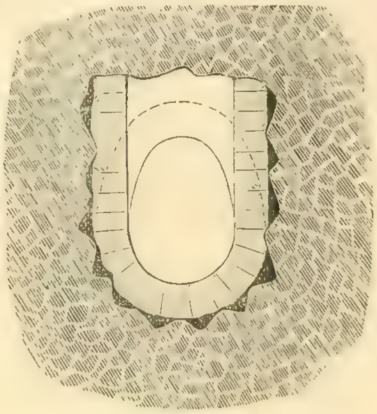


FIG. 15

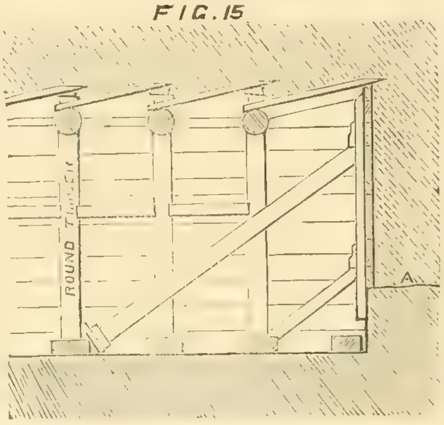


FIG. 16

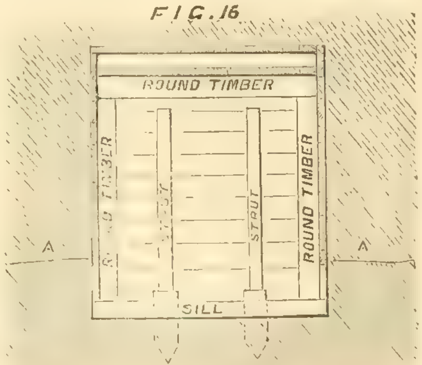
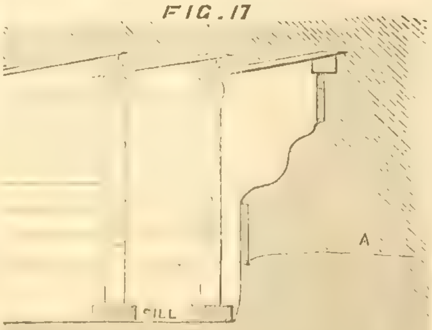


FIG. 17



here reduced to yards, feet, and inches, as being terms of more general application.

During 12 days and 12 nights the following lengths were driven in the various headings :—

	No. of Faces Worked.	Length Driven			Price per Lineal Yard.	Amount.			Deducted for Powder, Fuse, Candles, and Smiths' Work			Amount Paid to Men.		
No.		yd.	ft.	in.	s.	£	s.	d.	£	s.	d.	£	s.	d.
1 Shaft	One	7	0	4	63	22	8	0	1	9	7	20	18	5
2 ,,	Two	9	1	0	63	30	4	0	3	14	1	26	9	11
3 ,,	Two	6	2	0	80	26	13	4	4	12	7	22	0	9
4 ,,	Two	4	0	8	90	19	2	6	2	13	8	16	8	10
5 ,,	Two	4	2	0	120	28	0	0	4	4	3	23	15	9
6 ,,	Two	6	0	8	65	20	4	5	1	16	7	18	7	10
7 ,,	Two	3	0	4	65	10	2	0	3	4	7	6	17	5
8 ,,	Two	5	0	9	65	17	1	3	3	6	4	13	14	11
9 ,,	One	6	0	7	60	18	11	8	0	19	4	17	12	4
		52	2	4	73 avr'ge	192	7	2	26	1	0	166	6	2

There were thus 16 faces worked during this time.

It will be seen that an average progress of about 10in. was made at each face of the work each twenty-four hours. The work was let at the prices set down directly to the workmen, powder, safety-fuse, candles, and smiths' work being found and supplied to them, and deducted from their earnings at the agreed prices per fathom or per yard, as we have preferred to give them. They had the run of the store and of the smith's shop for what they wanted, and an account was kept against each shaft. Horse-work, ropes, buckets, skips, &c., were found for them, and yet they could not be kept to work at these prices. The completion of the tunnel was let at 18s. 6d. per cubic yard, being at the rate of 74s. per lineal yard for the excavation. The impossibility of trimming the bottom and sides to an even face made lining with masonry necessary, and as the finished work had to be left at least 4ft. 8in. high and 3ft. 6in. wide in the clear of the masonry, the hole to be blown out was nowhere less than 6ft. high and 5ft. wide, but practically it averaged 6ft. 6in. high, and 5ft. 6in. wide, the bottom and sides only in some parts of the tunnel being lined with masonry, made good to the roof of the excavation, as in Fig. 14, while in other parts an arch was turned, as shown by dotted lines. Thus the quantity of excavation was about 4 cubic yards per yard forward.

After the re-letting of the work observations were made of the number of men and horses employed during 14 weeks, from September 15 to December 29, and the quantity of work done during the same time, and the following is the statement. The work done during the time was as follows :—

	£	s.	d.
188 lineal yards of tunnel driven, at 74s.......	695	12	0
1,115 cubic yards of masonry set, at 20s. 6d....	1,142	17	6
70 feet of new shaft sunk, at (say) 20s.	70	0	0
	1,908	9	6

Besides this it must be said that the following materials were brought upon the ground—viz :—

570 cubic yards of dressed stone from the quarry.
269 cubic yards from the tunnel, dressed for masonry lining.
128 loads of lime.
256 loads of smith's ashes and sand.

The following amount of labour was spent upon this quantity of work—viz. :—

Miners	3780	Smiths...	160
Labourers	3400	Carpenters	159
Stone cutters... ...	1610	Sawyers	50
Masons	1122	Carters	596
Horses	1557		

About £1,870 must have been paid in wages and horse-keep during this time. The stone-cutters include those dressing the 570 cubic yards brought from a distance (about a mile), and the horses include those hauling lime, ashes, and sand, as well as those working the gins at the shafts.

Comparing the cost of powder, fuse, candles, and smiths' work with the length driven, it will be seen that it was about 10s. per lineal yard driven. There were about 4 cubic yards in a yard forward.

At another waterworks tunnel of similar size, driven through a hill of carboniferous or mountain limestone, the rate of progress at each face of the work was from 2in. to 3in. per shift of 8 hours. At another 5ft. high and 4ft. wide, through whinstone, basaltic or trap rock, the progress was from 6in. to 8in. every 24 hours at each face.

Fig. 15 is a longitudinal section, and Fig. 16 a cross section of a heading in very bad ground, being, above the level marked A, a wet yellow marl ; below the level A, a more solid blue marl. Fig. 15 shows the last three sets of timber, and a length mined forward ready for another set, the sill being laid upon the ends of which the props are to be set up, and upon them the head trees. Fig. 17 shows another length in the course of being advanced after this set has been got in. The sills are 12in. by 6in., the props of round timber, from 7in. to 9in. diameter, 3ft. apart, the roof-trees from 8in. to 10in. diameter. The clear height from the floor is 7ft., the clear width 6ft.

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SCHOOL BOARDS.

BATLEY.—On Thursday week the Batley School Board held their ordinary monthly meeting. It was decided to offer a premium of £20 for the best plan for Board Schools, and £10 for the second best plan.

CATERHAM.—The plans and specifications prepared by Mr. Richard Martin, of Caterham, for schools for 125 boys, 125 girls, 100 infants, with teachers' residences for this place, have been approved of by the Education Department, and the work is to be proceeded with at once. These schools are to be erected on the old site on the hill ; other schools are proposed to be built for the children in the valley.

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LEGAL INTELLIGENCE.

IMPORTANT TO BUILDING SOCIETIES AND BUILDERS.—At the Bromley Petty Sessions, held at Sidcup, on the 8th inst., Mr. Francis Ravenscroft, secretary to the Birkbeck Building Society, was summoned by the sewer authority of Beckenham, for causing a nuisance by allowing offensive matter to enter a county ditch on the Birkbeck estate. George Brooks, sanitary inspector, proved the nuisance. Defendant was manager of the Birkbeck Building Society. A filter had been erected on the land, but it did not work well, and was speedily choked, being made of charcoal and sand. In consequence of the sewer draining into the ditch the latter was very offensive for a quarter of a mile. For the defendant it was urged that the society were merely owners of the land and not of the houses, the allottees building the houses themselves. A resident named Atkinson emptied his cesspool into the ditch, and it had never been cleansed since, except by the rain water. Four other houses had also drained into the ditch. All the inhabitants of Beckenham paid sewer-rates, and it was clearly the duty of the sewer authority to provide drainage. A bottle of clear fluid which came from the drain filter was produced, but the Bench, after smelling it, said it was nevertheless offensive and injurious to health. The solicitor said Inspector Brooks was an occupier of a house draining into the ditch, and should have summoned himself. The society, as owners of the land, he maintained, were not liable. The society would construct proper sewers as soon as the Beckenham sewer authority would provide an outlet. The Bench said when the society sold land they should provide drainage. The solicitor said they provided drains to the sewer or outfall, but could not provide sewers, which would necessitate an expenditure of thousands of pounds, and would include the making of an outfall for the whole parish. It was thoroughly impossible for the society to do more than they did. Mr. George Grosvenor, one of the directors of the society, was called, and said that the drains made by the society were perfect. The society had also constructed two filtering tanks to deodorise the sewage before discharging into the county ditch. He produced specimens taken in September, and on the 4th and 8th of July, also a further sample of filthy sewage taken from the Surrey side of the ditch, and said the ditch was further fouled by a cow-house on the Surrey side and by other houses, and not from the houses built on the society's land. They had made arrangements with the Lambeth Water Company to flush the drains. Mr. Brooks said the object of flushing was to carry off the sediment stopped by the bush drain and filter. Witness said the flushing was to keep the drainage as pure as possible. Although they had large estates in all parts of the country, they had never been summoned before. Mr. Robert Owen, and Mr. Webb, also directors of the society, corroborated the evidence given by the last witness. William Cole, foreman to Mr. Pound, the contractor for the drainage work, proved that the drains were all properly made, and that no other outlet from the estate than that from the filter had ever been constructed. The Court was then cleared, and after consulting together a short time, the justices stated that, having examined the evidence, they had come to the conclusion that the sanitary inspector of Beckenham had made out his case to their satisfaction. They would not, however, make an order at present, but allow the question to stand over a month, either for the nuisance to be remedied, or for some satisfactory arrangement to be made with the sewer authorities at Beckenham.

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PARLIAMENTARY NOTES.

THE BIRMINGHAM SEWERAGE BILL.—Mr. Pell, on Monday, asked the President of the Local Government Board whether he was aware that under the 63rd section of the Birmingham Improvement Act, 1851, the council of the borough of Birmingham were authorised, with the sanction of a meeting duly convened, to make application to Parliament for the purposes of any Act relating to that borough ; whether such meeting was not held on February 16th, 1872, pursuant to the provisions of that section, which authorised the application to Parliament for the Birmingham Sewerage Bill of the present session; and whether, under these circumstances, any liability for the expenses of that application attached to the promoters of that Bill individually, as stated by him in reply to the honourable member for Sheffield on Monday, July 1st, and then adduced as a reason for the Government affording facilities for the passing of the Municipal Borough Funds Bill.—Mr. Stansfeld said that the answer he had given to the hon. member for Sheffield was founded on the general law, and the Act in question had not then been brought under his notice. He thought that the arguments were in favour of the Bill of the hon. member for York. In the third place, he was not satisfied that the Birmingham Improvement Act operated in the manner indicated by the hon. member.

THE LAMBETH AND VAUXHALL WATER.—Colonel North on Tuesday asked the Secretary of State for the Home Department whether, considering the report made to the Lambeth Vestry on the 4th inst. by Dr. M'Cormack, medical officer of health for the Lambeth district, that on the 18th of June he examined the water of the Lambeth Company, and also that of the Vauxhall Company, with results showing but very slight improvement in the water supplied by the Lambeth Company, and that the water of the Vauxhall Company continued to exhibit the same degree of impurity as it did the previous month, some means could not be adopted, either by fine or otherwise, to oblige the Vauxhall Company to furnish pure water.—Mr. Stansfeld would answer the question, as it was more within his province. The whole extent of the powers of the Board of Trade was this —that if a company should be proved to have furnished impure water or an insufficiency, the Board could serve a notice on that company to remove the cause of complaint, and if reasonable means were not taken within a reasonable time the Board could then, but not till then, take proceedings in a court of law to recover penalties. With respect to the facts the evidence before him did not carry out the allegations in the question. He had not seen the report of Dr. M'Cormack, but he had that of the water examiner for June, which stated that the Vauxhall water was clear and bright, and that the Lambeth water was clean but imperfectly filtered in consequence of the limited filtering area. Means were being taken to remedy the latter defect. Then there was the strong evidence in the report of Dr. Frankland to the Registrar General, which stated that the water delivered by the two companies in question was of fair quality.

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On Tuesday week the foundation stone of a new Wesleyan Methodist Chapel was laid at Hinderwell, a flourishing little town in the Cleveland district, near the extensive mines of Mr. C. M. Palmer. The present chapel has become too small. The architect for the new edifice is Mr. Thos. Hodgson, of Lofthouse. It will be a neat building in the Grecian style of architecture, and the estimated cost is over £500. It is to seat about 250 people. The stone was laid by Mr. Isaac Chadwick, of Whitby, to whom was presented an elegant trowel and mallet, as memorials of the event. The concourse was afterwards addressed by the Revs. G. Abbott, of Whitby, and E. P. Lowrey, of Lofthouse.

All SS. Church, Southampton, was reopened on Thursday week, after restoration under the superintendence of Mr. E. T. Howell. The ceiling, which is 95ft. long, by 60ft. wide, has been restored in design similar to the original, but of wood instead of plaster, the great advantage of which is that the weight of the ceiling has been reduced 25 tons. The pews have been reduced in height. The whole of the works have cost £1,900.

It is intended to build a handsome new church at Morley, at a probable cost of about £4,000, to take the place of the old chapel. Messrs. Lockwood & Mawson, architects, Bradford, have been instructed to prepare plans.

SIR GILBERT SCOTT.

Succumbing to the fashion, Mr. George Gilbert Scott will, we suppose, accept the "honour" offered him, and will henceforth be known as *Sir* Gilbert Scott. The outside world scarcely needed any such distinguishing mark by which to recognise his name, much less the members of the profession he has so long adorned. Mr. Scott has been known, and will continue to be known, by his works; they have given his name a lustre that cannot be dimmed, even by the extinguisher-like title conferred in turn on market-gardeners, sheriffs, and the upper footmen in the Royal establishment.

Mr. Scott, as we learn from "Men of the Time," was born in 1811, at Gawcot, near Buckingham, of which village his father was incumbent. His early love for art induced his father to place him with an architect, but the practice thus afforded gave him little opportunity for the cultivation of his taste. For some years he was in partnership with Mr. W. B. Moffatt, but this connection terminated in 1845. The "Martyrs' Memorial" at Oxford, in 1841, first brought him prominently into notice. It was followed by the new church at Camberwell in 1842-3. The great work of rebuilding the Church of S. Nicholas, Hamburg, destroyed in the great fire of 1842, was entrusted to him, after a competition, to which architects were invited from all parts of Europe. He also carried off the prize in another European competition, viz., that for the erection of the new Hotel de Ville and Senate House, at Hamburg. This building, however, has never been erected. In 1848 the Cathedral Church of S. John's, Newfoundland, still incomplete, was commenced from his designs. More recently the parish church of Doncaster, destroyed by fire, has been re-erected under his superintendence. Mr. Scott has also been employed in extensive restorations at the Cathedrals of Ely, Lichfield, Hereford, Ripon, Gloucester, Chester, S. David's, S. Asaph, Bangor, and Salisbury; and has had less extensive engagements at Exeter, Peterboro', Worcester, Rochester, and Oxford. At Chichester he was engaged, in conjunction with Mr. Slater, in the reconstruction of the central tower and spire; at Westminster Abbey he succeeded Mr. Blore, in 1849, as official architect of the Dean and Chapter, and has erected the new Gothic gatehouse and houses adjoining the west of the Minster, and has more recently restored the Chapter House. He has written, "A Plea for the Faithful Restoration of Our Ancient Churches," published in 1850; "Gleanings from Westminster Abbey," in 1862; and "Conservation of Ancient Architectural Monuments: a Paper," in 1864. The zeal which he displayed in the establishment of the Architectural Museum is still gratefully remembered. He was elected A.R.A. in 1852, and temporarily undertook, in conjunction with Mr. Sydney Smirke, the architectural lectures at the Academy, and in 1860 was elected R.A. He is the architect of the new Foreign Office, and, in conjunction with Sir M. Digby Wyatt, of the new India Office, and is now completing the group by the erection of the new Home and Colonial Offices. Space would fail us to record only the names of the churches he has built and restored throughout the country. Among his secular works may be mentioned—Kelham Hall, Nottinghamshire; Walton House, Warwickshire; Hafodunos House, North Wales; Lee Priory, Kent; the Town Hall, Preston; the Infirmary, at Leeds; and the new Midland Railway Terminus, at S. Pancras. For the Universities he has executed new chapels and other extensive works at Exeter College, Oxford, and S. John's College, Cambridge; works at University College, Merton, and New College, Oxford, and the entire rebuilding of the University buildings at Glasgow. The most marked of his recent works is the National Memorial to the late Prince Consort.

The foundation stone of a new church, dedicated to S. Peter, was laid on Monday week at Middlesboro'. The style is Gothic, the seats accommodate 315 people, and the cost is £1,500

HOUSE PLANNING COMPETITION.

It will be remembered that the referees in this competition, after specifying seven plans which deserved honourable mention, singled out twelve others which were "worthy of praise." (See Building News, April 12, 1872.) It was not our intention at first to give this "alphabetical list," and we consequently returned the drawings. It having, however, been suggested that it would be desirable to give these plans as well, we indicated our willingness to do so, and five competitors out of the twelve forwarded their plans, which we reproduce this week. The authors of those plans are M. H. Robinson, D. Maclaren, F. W. Collins, and W. J. Shrubsole. The author of "As You Like It" did not send his name. We have heard from several persons that this house planning competition, and the criticisms it has evoked, will probably introduce something like a new era in house planning.

AACHEN MINSTER.

To many travellers Aachen—Aiken, as our forefathers called it, with a nearer approach to the true speech of the country—and its minster will be their first German city, and their first German church. There (says the *Saturday Review*) they may see, for the first time on a gigantic scale, the tall aisleless apse with windows of boundless height, which so clearly fences off the churches of Germany alike from the square ends of England, and from the surrounding chapels of France. But setting aside this one feature, there is nothing about Aachen which specially connects it with German buildings rather than with the buildings of any other part of Christendom. It is rather one of a class belonging to no particular land, but scattered here and there through all lands. The round or octagonal church, very commonly with a choir added to the east and a tower added to the west—three things which can never be brought into real harmony with one another, but which, from their very incongruity, always produce a striking effect—is found scattered here and there from Jerusalem to Northampton, more common in some countries than others, but everywhere rare enough for each particular example to have a sort of personal interest of its own. The Temple Church in London and the renowned S. Gereon at Köln are among the examples which will occur to every one; but the peculiar effect of Aachen is best realised on a far humbler scale in the Church of S. John at Liège, and in the Church of S. Sepulchre at Northampton—we speak of this last as we knew it years ago; we believe that additions have lately been made to it. In all these three, without any kind of likeness in any other point, we find the three elements placed close together, but which no art can really fuse into one whole—the western tower, the central round, and the eastern choir. But the city with which Aachen and the church with which Aachen Minster really connect themselves are not to be looked for on either English or German soil. Aachen can never be so well understood as with the mind fresh from the memory of Ravenna, and the Imperial Minster better takes its place in the general order of things if we look at it with a constant reference to its parent church of S. Vital.

THE BILL-POSTING NUISANCE.

A correspondent of the *Times* having suggested the adoption of the Belgian (and, he thinks, French) plan of compelling posting-bills (*affiches*) to be printed on stamped paper, keeping the stamp at a low value, the writer of the money article in that paper very commendably goes somewhat out of his usual track and supports the suggestion (which was also made in reference to prospectuses and circulars of bubble companies). He says (as we have in effect said on previous occasions) that unless some steps are taken with regard to posting-bills and kindred eyesores, it will be idle to continue the expenditure of millions on the architectural decoration of London. In entire neighbourhoods the value of property is frequently in a great measure destroyed by some prominent house or other building being let to advertising agents. Tradesmen cultivate a dishonest notoriety by stamping their wares in indelible paint on structures which belong either to their neighbours or the public, and even the pavements of the streets are used for the same purpose. So universal is the habit of converting every edifice, no matter how costly, into an advertising space, that even companies and corporations, who might be expected to act as guardians of the general interests, are sometimes among the worst offenders; and immediately on the completion even of the Royal Exchange, Sir William Tite had the mortification of seeing many of its architectural features defaced by bills and boards, which remain to the present day. How long the river wall of the Thames Embankment will be spared is, owing to its peculiar eligibility and the rental it would yield, a question especially calculated to inspire alarm. Railway companies, however, are those who most totally, in this respect, disregard what is due to the community from whom they derive their powers. Wherever there is a railway bridge or arch, it is at once used so as to give the utmost air of squalid untidiness to its entire district, and the London, Chatham, and Dover Company, always among the worst in these practices, have just furnished a crowning specimen of their powers of disfigurement by allowing huge bills to be placed on their bridge at Blackfriars, which not only commands the new one erected by the City at a large outlay, and opened in state by the Queen, but also the greater part of the drive along the Embankment. In the State of New York there is a law against defacing public edifices, but in our metropolis it seems that as soon as the money of the ratepayers is expended on noble objects, perfect immunity is allowed to any one who, for the sake of a few pounds or shillings per annum, may choose to mar the effect of all that has been accomplished.

36, PICCADILLY

In our review of the International Exhibition we noticed as follows the high character of design and draughtsmanship reached by Messrs. Ernest George and Vaughan, in their admirable pen-and-ink sketch of No. 36, Piccadilly: "This building reminds one a little of a Venetian palace by its solid dignified massing, its use of surface ornament, and its open loggia with large round shafts, and capitals of a Venetian type; but the main features are more French and Flemish than Italian; the whole is of good Gothic, well put together, and the architects unquestionably understand what they are about." We this week give an illustration of the building, which has been erected by Messrs. Sotheran, Baer, & Co. It has a narrow frontage in Piccadilly, and a frontage of 100ft. in Swallow-street. Internally, height is given to the shop by a gallery or balcony in the place of the usual mezzanine floor, and by the windows to this gallery good light and ventilation is given to the shop. An oak staircase leads up to the gallery, and goes on to the second floor, which latter forms a show-room for second-hand books. The three floors above provide suites of rooms for residence or offices, and are approached from a separate entrance by a stone staircase with wrought-iron ballusters.

The elevation is of Portland stone, and in the treatment the architects have abstained from the heavy cornices and projections that so frequently obstruct the light and harbour the soot in our London streets. The general broad effect of light is pleasingly broken by the shadow under the loggia, which provides a balcony where no projection over the street would have been suffered, at the same time lessening the noise of the street traffic. Within the arches of the loggia are carved life-size busts of Shakespeare, Newton, and Michael Angelo, as representing Literature, Science, and Art. But the chief feature of the design is the introduction of colour in the elevations. The parallels consist of pictures in Powell's mosaic glass (*opeus sectil*), giving the history of literature. This series consists of

1. Egyptians inscribing hieroglyphics on a sarcophagus.
2. King Alfred being presented by his mother with a manuscript.
3. Monks copying manuscripts.
4. The dream of Guttenberg.
5. Caxton reading the first proof of the Canterbury Tales.

The long panel under the loggia is divided into three pictures, representing etching, lithography, and wood engraving. The figures are about 2ft. high, but the subjects being limited to two or three tints have sufficient breadth to tell their story from the street. These cartoons were drawn by Mr. Henry Burrow, and there is a pleasing character and formality about the figures that commends itself as architectural decoration. A stone dormer-window of the Nuremberg type rises out of the Piccadilly front, and in Swallow-street the attics are lighted by dormers of wood, the roofs being kept level with the ridge of the main roof.

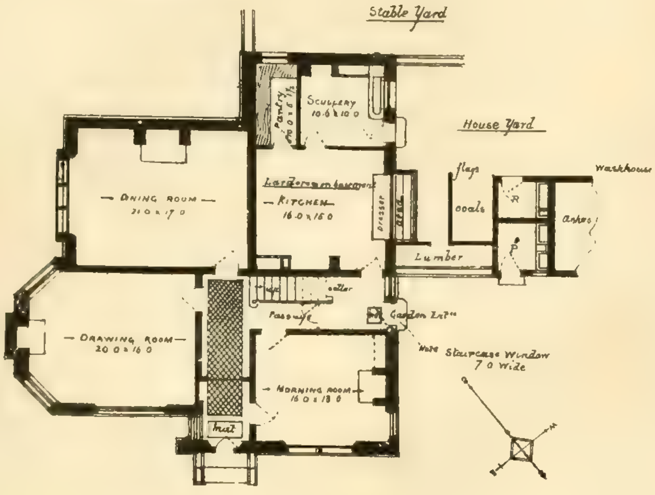
There is a quaint picturesqueness about the building, which is not, however, allowed to interfere with its practical utility, and we congratulate Messrs. George & Vaughan on their work.

The cost of the building is about £8,000, and has been carried out by Messrs. Hollands & Hannen, Mr. Ville acting as foreman.

HOUSE-PLANNING-COMPETITION

DESIGN FOR VILLA

ANGUIS IN HIBRA

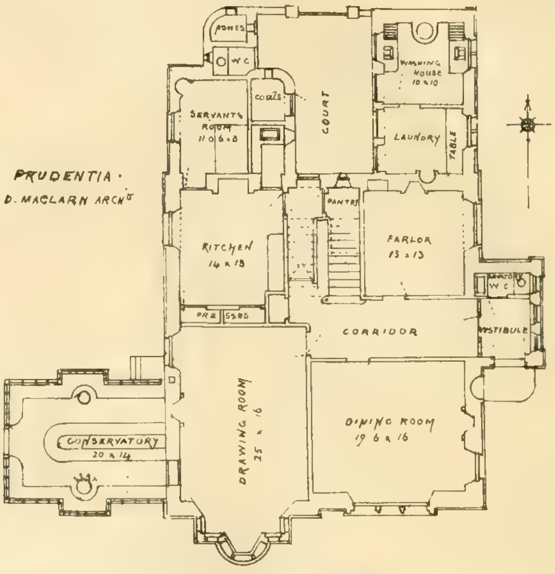


GROUND PLAN

Marshall Robinson
Bolton Lancashire

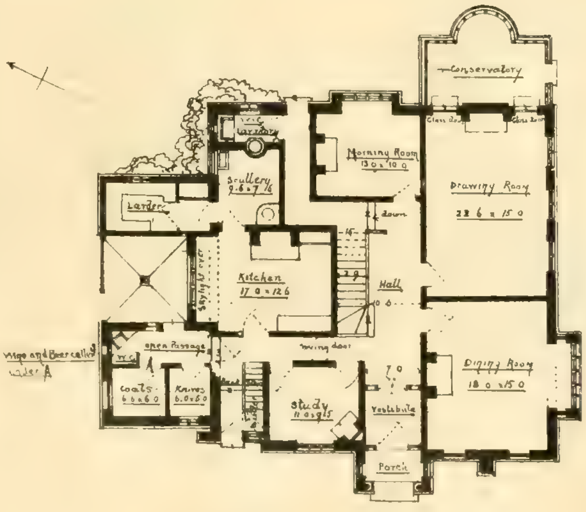
PRUDENTIA.

D. MACLARN ARCHt



PLAN OF GROUND FLOOR

10 5 0 10 20 FEET



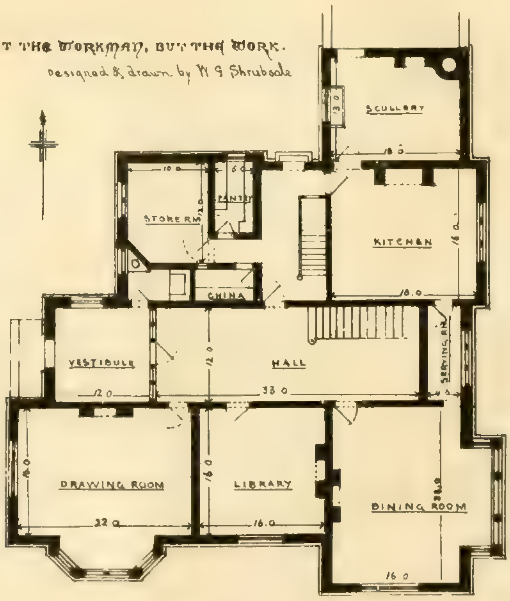
Ground Plan

OUT OF MY SCANTY LEISURE X.

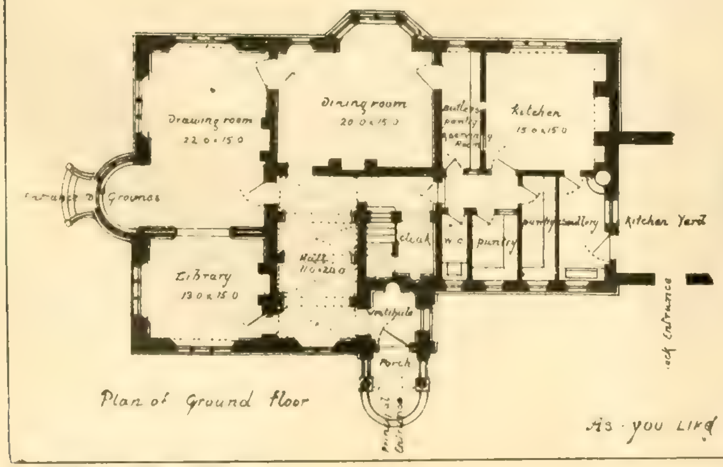
F H COLLINS ARCHT

NOT THE WORKMAN, BUT THE WORK.

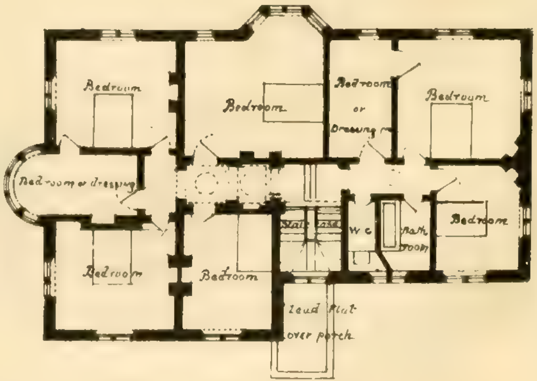
Designed & drawn by W G Shrubsole



GROUND PLAN



Plan of Ground floor

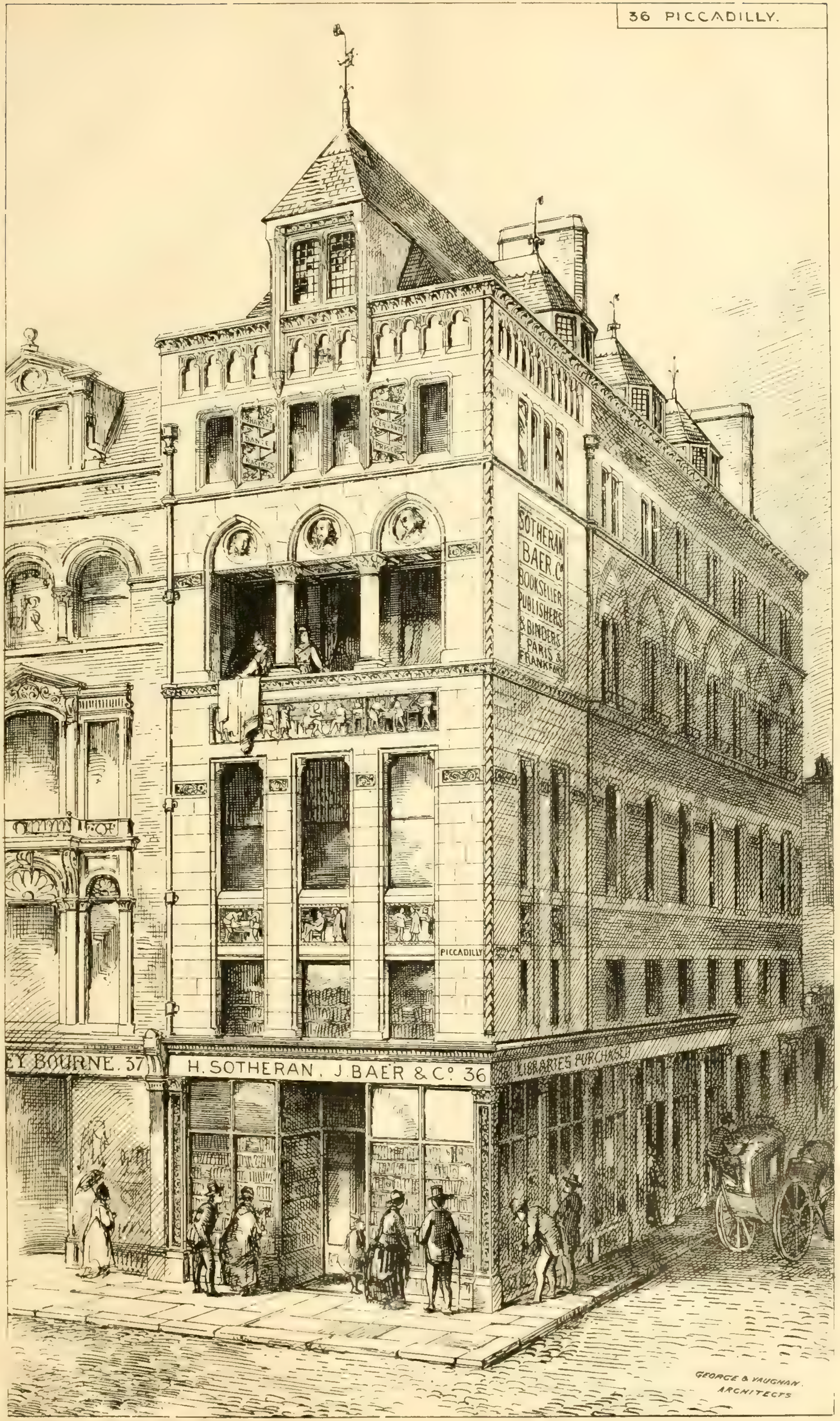


Plan of Bedroom Floor

As you like it.

Printed by Whiteman [illegible] Holborn

36 PICCADILLY.


SOTHERAN BAER & Co BOOKSELLERS PUBLISHERS & BINDERS PARIS & FRANKFORT
PICCADILLY
EY BOURNE. 37
H. SOTHERAN. J. BAER & Co 36
LIBRARIES PURCHASED

GEORGE & VAUGHAN.
ARCHITECTS

[illegible] Holborn London

Building Intelligence.

CHURCHES AND CHAPELS.

Birmingham.—The memorial stones of the enlargement of the Wesleyan Chapel and Schools, Lichfield-road, Birmingham, were laid on Monday. At present the chapel will seat about 550 persons, and it is proposed to afford accommodation for 950 worshippers, by extending the building at the back about 11ft., and putting up side and end galleries in the interior. A preacher's vestry, 22ft. by 17ft., over which an organ gallery will be erected, is also to be added. The addition to the schools consists of four class-rooms. The cost of the enlargement will be about £700, and the work is being carried out by Mr. Lee, under the superintendence of Messrs. Smith & Son, architects.

Chester.—Last week the memorial stone of a new Congregational Church, to be erected in Great Boughton, Chester, was laid. The new church is be built from the designs of Mr. T. M. Lockwood, architect. Its interior dimensions will be 68ft. in length, 39ft. in breadth, and 42ft. in height to the ridge. The style generally will be Early English, and it will be built of brick, with stone dressings and carved capitals and columns to the windows. The open seating inside is calculated to accommodate 470 persons. The cost, including the ground, will be about £2,000.

Colchester.—The Church of S. Mary-at-the-Walls, Colchester, was reopened on Wednesday week, after restoration to an extent almost amounting to rebuilding. The style of the church is Early English, and the building consists of nave, chancel, north and south transepts, with vestry attached to the north transept. Both the interior and exterior of the building have been carried out in red brick, interspersed with black bands of the same material. Added to the south side of the church there is a new porch, with moulded brick doorway and carved stone corbels, terminating with Bath stone copings and ornamental cross. Over the porch is a panel carved by Earp, of London, bearing the figures of the Virgin and Child. On either side of the church there are five windows of corresponding style to the building. To the external walls is added a striking parapet, with moulded and tracery brickwork and moulded stone coping, the arcade being supported upon ornamental iron columns, with Bath stone springers and ornamental brick arches, the responds east and west to the arcade being supported by richly-carved and moulded corbels. Added to the arcade there is a clerestory. Accommodation is provided for nearly 600 persons. The sittings in the nave, side aisles, and south transept are of stained deal, varnished, and those in the chancel are of pitch pine, varnished, the latter being also moulded and traceried. The roofs of the nave and south aisles are open-timbered, and consist of four framed principals, with moulded and carved ribs, and five sets of intermediate rafters, curved and braced with large moulded wall-plates, plastering being introduced between the rafters. The chancel roof is framed and braced with panel ceiling, the panel-work being formed of new material from New Zealand, called kaurie. This wood, which is rare, is also handsome, and gives a very pleasing effect. The chancel has a very bold arch of moulded brick, intermixed with Bath stone, supported by carved corbels, with Forest of Dean shafts. The nave and transepts are paved with red and black tiles, and the chancel with Maw's encaustic tiles. The heating apparatus and gas-fittings were supplied by Messrs. Joslin & Co., of Colchester (with the exception of two large brass and iron gas standards by Hart, Son, Peard, & Co.). The font is from a design by Mr. Albert Hartshorne, and has been executed by Mr. L. J. Watts, of Colchester. Mr. A. W. Blomfield, of London, is the architect from whose plans the works have been carried out, Mr. Gardner, of Coggeshall, being the contractor, and Mr. Heathcote the clerk of the works. The whole of the carving has been done by Mr. Earp, of Lambeth.

Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels.—This Society held the last of its meetings for the present session on Monday. Grants of money amounting to £2,390 were made in aid of the following objects, viz.:—Building new churches at Eastwood, in the parish of Rotherham, York; Newington, S. Mary, Middlesex; Owlerton, in the parish of S. Philip's, Sheffield; Stockton-on-Tees, S. John the Baptist, Durham; Wigan, S. Michael, Lancashire; Wimbledon, Surrey; and Wyesham, in the parish of Dixton, near Monmouth. Rebuilding the churches at Allendale, near Carlisle; Cheswardine, near Market Drayton, Salop; Dorking, S. Martin, Surrey; Huntington, near York; Leysdown, near Sheerness; Preston Candover, Hants; Reading, S. John's; and Yspytty-Ystwith, near Aberystwith. Enlarging or otherwise increasing the churches at Balcombe, Sussex; Bransgore, Hants; Bristol, SS. Philip and Jacob; Bruntingthorpe, Leicestershire; Bryngwyn, near Hereford; Clapham, Sussex; Colne Engaine, Essex; Flimwell, Sussex; Hatfield Peverell, Essex; Herne-hill, S. Saviour, Surrey; Hucknall Torkard, near Nottingham; Kittisford, Somerset; Linton, near Ross; New Brentford, Middlesex; Isle of Portland; Sheepscombe, near Stroud; Sittingbourne, Kent; Stepney, S. Philip's, London; S. Keyne, near Liskeard, Cornwall; Tiffield, Northants; Welby, near Grantham; Wramplingham, Norfolk; Backwell, near Bristol; and Tollesbury, Essex. Under urgent circumstances, the grants formerly made towards rebuilding the churches in Easton-in-Gordano, near Bristol, and Silian, near Lampeter, Cardigan, were each increased. A grant was also made from the School-church and Mission-house Fund towards building a school-chapel at Goodwich, in the parish of Llanwnda, Pembroke. The Society likewise accepted the trust of sums of money as repair funds for S. Peter's Church, Birkdale, Lancashire, and All Saints' Church, Blenheim-road, in the parish of S. Giles, Camberwell, Surrey.

Leicester.—The memorial stone of a new Baptist Chapel was laid at Leicester on Tuesday week. Mr. Shenton is the architect. The church is cruciform in plan, but is a departure from the arrangement usually adopted in buildings erected in that form, inasmuch as the intersection of the four arms of the cross is converted into an octagon. The extreme internal length from the nave to the apse is 120ft., and the clear breadth across the transepts is 113ft., the width of the central octagon being nearly 50ft. The style chosen is an adaptation of the Early Gothic; but as the church will be mainly a brick structure no attempt has been made to give it a high decorative character. The chief architectural feature of the building will be the octagon, whose internal height is 55ft., and whose elevation on the interior is 85ft. from the ground to the top of the lantern. Around its upper part will be a range of lancet-headed clerestory windows, 28 in number. The height of the nave and transepts will be 32ft. from the floor to the ceiling. The seat accommodation will be as follows:—Ground floor, 700; gallery floor, 70; total, 770.

Little Laver.—The parish church of S. Mary-the-Virgin, Little Laver, was reopened on Tuesday week, after restoration and enlargement. The ancient fabric, which possessed several features of interest, has been completely renovated. The old eastern wall and window have been removed, and a new chancel has been added. An organ chamber has been erected to the north of the chancel. The church is benched with carved oak benches, choir stalls of the same material being substituted for the old-fashioned high-backed pews. The restoration has been in hand about twelve months, and has been carried out by Messrs. Elston, builders, of Sudbury, from plans by and under the superintendence of Mr. J. Goldicutt Turner, architect, of Wilton-place, Grosvenor-square.

Manchester.—A new Baptist Chapel and Schools were opened in Moss-lane, East Manchester, on the 9th inst. The style of the building is Gothic. In lieu of tower and spire, the front gable of the chapel is flanked with pinnacles and turrets. The walls are externally faced with pitch-faced wall stones. The windows, doors, and turrets are of Welsh sandstone. The chapel, which is 98ft. long by 49ft. wide (the width across the transepts being 60ft.), is entered through a three-arched groined porch. The caps of the columns supporting arches of porch, together with some panels in arch spandrels, corbels, and finials, are very richly carved. The interior is divided into nave and aisles. The roof is open-timbered, and has a very handsome effect. It is supported partly on stone corbels in side walls and partly on iron columns, which divide the nave from the aisles. Galleries run round three sides of the building, and the organ gallery, which is separated from the body of the chapel by a fine stone, triple arcade, with carved capitals, is in an apse situated behind the pulpit. The chapel contains 850 appropriated sittings. The school buildings contain on the ground floor a school-room 50ft. by 30ft, which is 15ft. high, and an infant class-room with raised gallery for 100 infants. Over these are compartments for the chapel-keeper, a lecture-room, and class-rooms. The tea-rooms and vestries complete the arrangement. The cost of the building is about £10,000. The architects are Messrs. Paull & Robinson, of Manchester; the general builder being Mr. Joseph Robinson, junr., of Hyde. The carving was done by Mr. Evan Williams, now of the firm of Evan Williams & Millson, of City-road, Manchester; the heating by Messrs. Haden, of Trowbridge; and the gas-fittings were supplied by Mr. J. W. Dovey, of Manchester.

Paddington.—The beautiful Church of S. Mary Magdalene, Paddington, was very seriously damaged by fire on Saturday last. It appears that the workmen employed in completing the new roof resumed work in the morning after the 8 o'clock celebration. A coating of pitch had been, or was in course of being, placed upon the rafters before the slates could be fixed, and shortly before 9 o'clock one of the workmen engaged near the belfry accidentally dropped a lighted taper from his hand on to the unfinished roof. The inflammable material there at once took fire, and spread with amazing rapidity, for in a few minutes the entire roof of the chancel was in flames. In spite of every effort the flames were not subdued for upwards of an hour, when the entire roof of the building had been nearly destroyed. It is some consolation to state that the interior of the church is very little damaged; the windows are, as a rule, untouched; the organ has sustained only trifling damage, and the walls are uninjured. Captain Shaw thus reports the damage:—"Roofs of clerestory and chancel destroyed; roofs of aisle and transept severely damaged by fire; rest of church and contents by heat, smoke, and water." It was stated that the fire was caused by a lighted candle falling on asphalte, with which the rafters of the roof had been covered. A correspondent writes to state (1) that the covering was of pitch, and not of asphalte; (2) that asphalte for roofing, for roads, for basements, &c., can, and should be, rendered entirely uninflammable. Official trials made by the Engineer to the City Commissioners of Sewers have resulted in positive proof of the absolute uninflammability of the material properly called asphalte.

BUILDINGS.

Bradford.—The new covered Market at Bradford is nearing completion. The style is Italian, and the principal frontage is 180ft. long, and the cost, exclusive of the external shops, about £13,000. Messrs. Lockwood & Mawson are the architects.

Bradford.—On Friday last, at the meeting of the committee of the Bradford Corporation, it was agreed to recommend the Council to agree to place a clock and chimes in the tower of the Town Hall, and to accept the tender of Messrs Gillett & Bland, of Croydon, for the execution of the work. Tenders were also submitted from Mr. W. Potts (Leeds); Messrs. E. Dent & Co. (London); and Messrs. Cooke & Son (York). The clock will be illuminated. There will in all be 13 bells—four bells to strike the Cambridge quarters, eight bells for the chimes, and one large bell, three tons weight, to strike the hours. Fifteen tunes may be played on the chimes, and this number can be readily increased.

Edinburgh.—The Lauriston Catholic Schools have lately been opened. The schools have a western frontage of 100ft. The building in form presents the three sides of a parallelogram. All the class-rooms present, on a small scale, the appearance of an art gallery, being decorated with a series of engravings by Grüner, after Raphael's famous compositions in the loggie of the Vatican. These engravings, presented by Mr. Hope Scott, of Abbotsford, give in a succession of views the whole of the history of the Old Testament. The windows have all stone dressings, and the front is diversified with gablets. At the south end there is a tower, containing a staircase, surmounted by an iron cross. The whole of the designs have been carried out according to the suggestions of the Rev. J. H. Wynne along with Mr. R. Thornton Shiells, architect, Edinburgh.

Hospital for Sick Children.—On Thursday, July 11, the foundation stone of the new Hospital for Sick Children, in Great Ormond-street, was laid by H.R.H. the Princess of Wales. This hospital has been established 25 years, during which time it has been gradually increasing until the two ordinary dwelling-houses in Great Ormond-street would hold no more, when a branch establishment was formed at Highgate. The new hospital is to be built upon a piece of ground behind, and on the site of the old one, which is to be pulled down. The new building will contain accommodation for 220 patients (or 109 in excess of the present number), a chapel, dispensaries, operating and waiting rooms, &c. Mr. E. M. Barry, R.A., is the architect. Contributions are solicited.

Manchester.—The corner stone of new premises in connection with the City-road Wesleyan Chapel, Cornbrook Park, was laid on Saturday afternoon. The buildings comprise a schoolhouse of stone and brick, in the Gothic style, and vestries and chapel-keeper's house. The schools will contain two school-rooms, 33ft. by 30ft., and 55ft. by 29ft.;

four class-rooms, 14ft. by 8ft.; and a recreation shed. The cost of the buildings will be about £2,700. The architects are Messrs. Medland & Henry Taylor, of S. Ann's Churchyard, Manchester, and the builder is Mr. Cardwell, of Altrincham.

Saltburn Convalescent Home.—Through the liberality of the Pease family, Saltburn-by-the-Sea will soon be in possession of a convalescent home second to none in the kingdom for completeness and accommodation. This noble structure has been erected at the sole expense of the Messrs. Pease, of Darlington, for their various workpeople who may require the benefits to be derived from change of air, careful nursing, and nutritious diet. The building has been designed and carried out by Mr. Thomas Oliver, architect, of Newcastle.

Warrington.—On Monday week new (Roman) Catholic Schools were opened at Warrington. The style is Gothic. The school is capable of accommodating 750 children. It has two stories. The exterior is plain, solid-looking, and unpretentious. It is constructed of brick, with blue-brick edgings round the windows. The designs were furnished by Mr. E. W. Pugin.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

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The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable

Received.—A. and P.—W. F. D.—E. W. P.—J. P. S.—J. C. —G. T. R.—H. E.—Aspiring Architect.—J. H. B.—Concrete.—H. and P.—W. & Sons.—G. H. G.—L. W. and U. —W. B.—J. A. C.—E. B.—W. B. B.—E. S. T.—House Planner.—T. R. S.—B. F.

James Leddingham.—Sketch returned.

G. W. Browne.—Portfolio returned.

H. L. E.—If the facts be as you state, our decided opinion is that you have a prior claim, and that the patent is not valid. But avoid, if you can, an appeal to law. In such appeals, in four cases out of the five, the lawyers get the oyster and the disputants the shell.

J. M. Smith.—"Theseus" to hand. Thanks.

E. B. S.—Sketch returned.

A Competitor.—You will see that your desire is partly complied with in this week's number.

E. Williams.—Apply to Secretary of the Architectural Association, 9, Conduit-street, Regent-street.

Jas. Patchett.—In a future number. The question of concrete is now being discussed in the *English Mechanic.*

Correspondence.

SPURIOUS CRITICISM.

To the Editor of the Building News.

Sir,—We have read with some surprise and not a little amusement an article, signed "J. P. S.," which appeared in the Building News of July 12. Had the writer of that article read the paragraph which accompanied your illustration, he would have learnt the name of the architect who designed Holdenby House, and would have been spared the grief which he says that he felt at seeing such a building coming from our firm. It would certainly never have occurred to us to imagine that the famous work of the great Elizabethan architect could be unknown even to the least informed of architectural critics.

"J. P. S." says that we have used "mullions and transoms *pretending* to carry people back to the days of the Tudors." If he can only discover some mullions and transoms that will *really* carry people back to the days of Tudors, he should at once avail himself of their services, and make the acquaintance of the architecture of those times. If, however, his search should be in vain, he need not on that account despair, for in Gwilt's "Encyclopædia of Architecture" he will find a concise account of Tudor and Elizabethan architects, and in Nash's "Mansions of the Olden Time" some admirable drawings of the houses which they built.

Let us suggest, too, that Holdenby House possesses historical as well as architectural claims. It was built for Sir Christopher Hatton, Queen Elizabeth's Lord Chancellor, and was esteemed by him "the last and greatest monument of his youth." When it passed from him to the Crown, it became a favourite residence of the Stuarts, and it was here that Charles II. was confined by the Parliament before he was removed to Whitehall to have *his head beheaded*, or, to use the precise words of "J. P. S.," to have his "proper appropriate capital decapitated!" We take leave of our reviewer in a sentence of his own. Criticism! Criticism! "What horrors have not ere this been perpetrated in thy euphonious name!"—Yours, &c. R. Herbert Carpenter.

4, Carlton Chambers, 4, Regent-street, S.W.
July 19, 1872.

FIRES.

Sir,—The recent lamentable fire at the Church of S. Mary Magdalene, Paddington, is one more added to the list of buildings seriously damaged in consequence of the carelessness, or stupidity, of workmen. Why is it that the unprotected flame of a candle should be permitted to wander amidst the dry timbers of a roof, or be left to do its destructive work in the "action" of an organ? The carelessness of plumbers is well known, and they and all other workmen engaged on work where artificial light is a necessity should be compelled to carry candles carefully fixed under a glass covering, and so that in the event of an upset the damage would be confined to the lantern itself. Cannot some of your readers suggest an efficient remedy for the prevention of a similar accident to that at S. Mary, Magdalene?—I am, &c. W. W.

[We may mention another instance which has recently been told us. On the day of the great Liberal banquet in the Bath Theatre, a workman clumsily spilt some burning naphtha on the stage, which almost instantaneously set the woodwork on fire. Fortunately three or four persons were standing by and as instantaneously put out the flames; or in a few moments, in all probability, the theatre would have been doomed.—Ed.]

SCHOOL PLANNING COMPETITION.

Sir,—Many of "T. P.'s" suggestions, I should presume, were considered to be good, but I must myself beg to take exception to Nos. 1 and 8. The former would make it exclusively a competition for the particular class of schools required by the London Board, whilst the latter would probably deter many competent competitors (chiefly young men) from engaging in the contest.

Referring to "H.'s" second letter on the lighting of schools, I may remark that I feel somewhat amused at his style of imputing ignorance to all who may differ from his particular views on the subject. And whilst mentioning this subject (as he has referred to my plans for the S. Austell Schools), I cannot well avoid alluding to the fact of my opinions being endorsed in every particular by Mr. Robson, architect to the London School Board, in his able paper on school planning read before the Architectural Association.

In reply to "H.'s" challenge for facts to support assertions, I may state that the last schools completed from my designs were principally lighted from the wall behind children, and from the fact of there being a sufficient area of glass, and the same placed sufficiently high above the floor, I could perceive no shadow either on the children's faces, books, or slates, that "H." writes so much about. I have also put the question to the master of this as well as to the masters of other schools similarly lighted, and their reply to me has invariably been, that they "thoroughly approved of the position of the windows;" and their principal reasons are that the children are not looking at the blackboard or easel with the sun or light glaring in their faces, and there is space opposite on the wall for the disposal of all kinds of school furniture, &c. I might add many other reasons in addition to those in my former letter, but time and space precludes my doing so; and I have not the slightest doubt but that there are many gentlemen connected with school building who could corroborate these views.

I may add that I consider it is necessary to have at least one window on the side opposite the children in large schools, for the purpose of through ventilation, as I intimated in my previous letter.

"H." speaks of the cheeseparing of School Boards. I think the Board that allowed him funds to carry a roof 5ft. beyond the external face of the wall, because he had injudiciously placed the children facing the sun, could not be thus accused.—I am, &c.,

Par Station, Cornwall. S. Trevail.

Sir,—I have read with much interest the various letters contributed by your correspondents regarding the proposed competition of school buildings, which you have so kindly instituted; and, while I approve generally of the suggestions submitted for your consideration, exception, however, may be taken to that of your correspondent with regard to compliance to the rules of the Council of Education. I think this is altogether unnecessary, and as your correspondent, John T. Lee, says, should be left to the discretion of the competitors, whose aim should rather be to produce the best plans of the required accommodation with due regard to comfort and convenience independent of the rules of the Education Department, which may be taken as a guide, but not necessarily adhered to. In addition to the suggestions submitted, I think it would be a matter of great importance that the drains should be clearly shown on the plans, (say) by a double line; also that perspectives should not be sent, as they are not at all essential when planning is the all-important question; if you should think it otherwise by all means make them binding. The suggestion of "Maclarenda" regarding the block plan is good, and should be acted on.

The results likely to proceed from such a competition as this are great, considering that school planning is at present a matter of great importance, and if carried out successfully will, I have no doubt, be highly interesting, as well as profitable to all concerned.—I am, &c.,

Malcolm Stark, Jun.

177, S. Vincent-street, Glasgow, July 11.

HOLDENBY HOUSE.

Sir,—In my notice of Holdenby House in the article on "Spurious Eclecticism" in your last, it should have been noticed as a restoration only, and that, therefore, Messrs. Slater & Carpenter are not to be blamed, I presume, for the defects remarked in it.

J. P. S.

NOTES ON EARTHWORK.

Sir,—In notes on earthwork, in your issue of July 12, there is a mistake in reckoning up the cost of brick sewer in third column, page 22. The sum is given as £20 3s. 6d.; it amounts to £24 18s. 6d. Considering that it is clay and gravel, is not the amount for sharpening picks very high? Is there not a mistake?—I am, &c., Hurtmore.

WATER SUPPLY AND SANITARY MATTERS.

Constant Water Supply for London.—The Board of Trade have appointed Lord Methuen, Captain Tyler, and Mr. Rawlinson, C.B., to hold an inquiry as to the "regulations" submitted by the London water companies conditional to providing a constant supply of water for London.

Ventilation of Sewers.—At the last meeting of the Metropolitan Board of Works, the Committee on the Ventilation of Sewers presented a report upon the resolution of the Board of the 26th of June, 1868, referring to them the question of the ventilation of the sewers belonging to the Board, especially to advise the Board as to the expediency of offering a premium (by public advertisement) for the best practicable plan of effecting such ventilation; and stating that they have arrived at the opinion that it is undesirable to offer a premium for a plan of ventilation, as it appears that no one plan would be applicable to the whole of the metropolis; and recommending that the committee be further authorised to pursue their investigations, and to deal with each case that arises according to the particular circumstances of the same, reporting from time to time the results to the Board. Mr. Saunders, in moving the adoption of the report, said no one system was applicable to the whole of the metropolis, but each case must be treated upon its peculiar exigencies. They used charcoal boxes, and in every possible instance the up-cast shafts of factories. Next to draining the land, there was nothing of such importance as keeping the noxious gases arising from sewage from reaching the population. The report was adopted.

Mr. Gibbs, of the firm of Antony Gibbs & Son, has offered to bear the whole cost of the erection of the chapel of Keble College, Oxford. It is estimated by the architect, Mr. W. Butterfield, that the cost will be between £25,000 and £30,000.

Intercommunication.

QUESTIONS.

[2609.]—**Plaster.**—What are the injurious effects to plaster from using sand that has been subject to tides touched with salt water? How can I detect salt in the sand, supposing it is not noticeable to the taste?—ANXIOUS.

[2610.]—**Ice-House.**—Will some one kindly give as simple directions as possible for making an ice-house in the country, and state the best manner of preserving the ice?—M. W. G.

[2611.]—**Brick Vaulted Arches.**—We have a reservoir in course of construction which we purpose to cover with 9in. brick segment arches of 8ft. span. We wish to know which of the two following methods is considered to possess the greatest amount of strength—viz., two separate rings of bricks, or the arch turned and bonded with headers and stretchers. We are inclined to think the last mentioned the strongest, as it would require but one key. We wish to know if the above has ever been tested.—AVALON.

REPLIES.

[2605.]—**Strength of Brick Bridge.**—Some months ago there was a series of articles in the BUILDING NEWS entitled "Notes on Brickwork," to which I refer "Querist" for a method of determining what he wants to know, viz., what safe weight per square foot will a brick bridge carry, the span of which is 12ft., its rise 2ft. 3in., and the thickness of the arch 18in.? I find by the method given in one of these articles (No. 10) that the bridge in question will carry an extraneous safe load—that is, a load in addition to its own weight—of from 1 cwt. to 4 cwt. per square foot of roadway, according to the strength of the bricks of which the bridge may be built, on this assumption, that one-twentieth of the ultimate strength of any brick is a safe load, and that the ultimate strength of different kinds of bricks varies from 20 tons per square foot in the weaker to 40 tons per square foot in the strongest kind. It is stated in the article to which I refer that very strong bricks have an ultimate strength of 50 tons per square foot, and ordinary bricks 30 tons, but without knowing what kind of bricks "Querist's" bridge is built of I prefer, in answering his question, to keep well within the mark. Any experienced engineer, looking at the sketch of this bridge given in last week's BUILDING NEWS, and assuming it to be ordinarily well built, would say "That bridge is strong enough for anything," unless it be in the abutment, which appears, in comparison with the strength of the other parts, disproportionately weak.—C. S.

[2606.]—**Ornamental Brickwork.**—A series of articles, the first of which appeared in the BUILDING NEWS of July 29, 1864, will give "D. F." all the information he wants, and perhaps more. Illustrations are given of the following places:—S. Giles's National Schools (window); Giurici Palace, Lucca; S. Gemignano, Tuscany; a window of a house at the corner of Roodlane, London; Tavistock Chambers, Southampton-street; a building at Wandsworth, Surrey; a warehouse in Eastcheap; a church in Westminster-bridge-road, &c.—A READER.

[2608.]—**Framed Floors.**—Double floors consist of three series of joists—viz., binding joists, bridging joists, and ceiling joists. Framed floors differ from double floors only in having the binding joists framed into large timber girders. An experiment was performed on the relative strengths of single-joisted and framed floors. Two models were made 18in. square; the single joists of the one contained the same quantity of timber as the girders alone of the other. These were placed in a wooden trunk 18in. square inside, having a strong projection all round for the floors to rest on. Small shot was poured gradually over. The single-joisted floor gave way under a weight of 487lb.; the framed floor gave way with a weight of 327lb. See "Encyclopædia Britannica," article "Roof."—CARPENTER.

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The construction of a tramway from Pimlico, via Vauxhall-bridge, to Kennington and Camberwell is now completed, and the line will be opened for public traffic in a few weeks. The toll derived from the cars running over the bridge will amount to £1,000 a year. A complete and direct route from Greenwich to Pimlico and the West End will thus be opened out.

A pleasant item of intelligence is that Sir Edwin Landseer is very near a complete recovery from his long and serious illness.

An influential meeting has been held in Belfast to devise means for the erection and support of a convalescent hospital. The ground for it, consisting of 14 acres of the Throne Lands, free of rent, has been presented. £3,500 has been collected in aid of the building fund.

The Emperor of Germany has given to Cologne Cathedral twenty-two cannon, taken from the French, which weigh over 50,000lb., and are worth 90,000frs. A new bell is to be formed with this material, 17ft. high, and 13ft. in diameter at the base. It is to be called the "Imperial Bell," and will be the largest in Europe, except the great bell of Moscow.

Our Office Table.

TESTIMONIAL TO A BOROUGH SURVEYOR. — A very gratifying compliment has been just paid to Mr. J. Lemon, C.E., borough surveyor at Southampton. At a meeting of the members of the S. Mary's Liberal Registration and Ratepayers' Association held on April 2nd, 1872, the President in the chair, it was proposed by Mr. James Lumby, seconded by Mr. Jonas Nichols, and carried unanimously:—"That the hearty thanks of this meeting be given to James Lemon, Esq., C.E., for the vigilance he has manifested in his office of Surveyor of the Borough, especially in compelling owners of land to make all new roads, whereby a saving of upwards of four thousand pounds has been secured to the ratepayers." The above resolution is brilliantly illuminated with an elaborate ornament, in which is introduced a representation of the borough arms.

WEIGHTS OF BELLS.—The present bells of the Cologne Cathedral, which were cast as early as any others in the middle of the fifteenth century, weigh—one 12,000lb., the other 22,400lb. The Kaiserglocke, which will shortly be cast, will be the largest swinging bell in the world; for those at Pekin and Moscow, which are larger, are fixed bells. The diameter on the lower rim will be 13ft., the height being 17ft., and weight 50,000lb. The following are the weights of some of the largest bells in Europe:—Vienna, 36,000lb.; St. Peter (Rome), 38,000lb.; Notre Dame de Paris, 34,000lb.; "Big Ben," 32,340lb.; and Erfurt, 27,936lb. According to the German papers, the Emperor has made a "munificent and truly imperial gift" by sending 22 French guns from the Strasburg Park to be molten into the "Kaiserglocke," which is to hang in the south campanile. The weight of these guns is 500 cwt., valued at £3,740.

NEW HOSPITALS IN PARIS. — A medical correspondent says that it has been decided upon to complete the new Hôtel Dieu, and to raise another new hospital in the Ménilmoutant quarter of Paris. The former will be so modified that the objections that have been made against it in a hygienic point of view will in a great measure be removed, and, judging from the plan, the latter is to be a perfect model of a hospital. It is to be built on the pavilion system, each block being isolated. The wards are to be spacious, and not to contain more than twenty-two beds each. In addition to these are several rooms which will be available for from one to four beds. Each ward is to have its own staircase, but bed-ridden patients will be hoisted up by machinery to the upper stories. At the first story each pavilion is to be surrounded by a terrace, which in the hot season will be covered over by canvas, so as to protect those who can move about from the direct rays of the sun. There are to be separate buildings for variolous and lying-in patients, each to be surrounded by a garden, and to have no communication with the other wards. The whole of the building will be warmed by steam, and proper ventilation will be secured by a system of pumping air through the wards. The hospital will be a great acquisition to that quarter of the city, which is peopled chiefly by the working classes. The hospital will furnish 550 additional beds.

NEW PIERS AT DOUGLAS, ISLE OF MAN.—The Queen's Landing Pier at Douglas, Isle of Man, was opened on Monday, the 24th ult. This pier, which has been constructed at a cost of £46,400, is 1,100ft. long, 50ft. wide, and 52ft. high, built of solid concrete blocks, well cemented together. There is a depth of water of from 6ft. to 18ft. at low tide at the several landing-stages of the pier. On the same day, the foundation-stone was laid of the new Battery Pier, which, intended to shield the harbour against stormy seas, will extend 550ft. in the direction of east-north-east from Douglas Head, the southern extremity of the bay. The cost of this pier is estimated at £52,000. The engineer for both works is Sir John Coode, C.E., Mr. W. Powell being the resident engineer.

A CATALOGUE OF HOSPITAL DEFECTS.—The *Correio Medico de Lisbon*, in concluding a series of articles on the S. Joseph's Hospital in Lisbon, sums up the shortcomings of the institution in the following terms:—The hospital is badly situated and badly constructed; more than eight hundred patients are crowded in the four stories of which it consists. There is no ventilation. There are no means of warming, not even in winter, when the temperature in the wards falls to 37 or 38 deg. Fahr. The light of the sun does not enter the wards. There are no latrines. There are no wards for venereal diseases. There are no wards or sections of the building for separating cases of severe operation. There are no quarters for the reception of delirious patients. There are no wards for the isolation of patients suffering from contagious diseases. There are no convalescent wards. There is no provision for personal cleanliness. Thus, as regards hygiene, there is a total absence of all the necessary conditions. The Portuguese Government has lately issued an order for the formation of a commission to find a site, and to present plans for a new hospital.

CHURCHES STRUCK BY LIGHTNING.—On Saturday week the tower of Gedney-hill Church, Norfolk, was struck by the electric fluid. A portion of the solid stone mullion in the west window was thrown with terrific force into the church, the broken glass and *débris* being scattered in all directions. The clock in the tower was suddenly stopped by the concussion, and the strong solid stone arch of the window was cracked like a piece of glass. The thunderstorm of Friday last caused immense damage both in Derbyshire and Leicestershire. Syston parish church was struck by the electric fluid, knocking off one of the pinnacles and an upper angle of the tower.

THE YORK STAIRS WATER GATE.—At the last meeting of the Metropolitan Board of Works, the Works Committee presented a report stating that the Committee had received a letter from the Science and Art Department, South Kensington, requesting that the art pupils might be permitted to sketch and measure the York Stairs Water-gate (popularly attributed to Inigo Jones, but in reality the work of Nicholas Stone, sen., Master Mason to King James I.), which is situate at the bottom of Buckingham-street, Strand, overlooking the ornamental grounds on the Victoria Embankment. It was also wished to remove a portion of the earth for that purpose, as the Gate is at present half buried. On the recommendation of the Works Committee, it was resolved that the Department be referred to the proprietor of the Gate, with a view to inducing him to remove the gateway, so that it may form a finish to the street and be on the same level.

LEWES SCHOOL OF ART.—A Queen's prize has been awarded in the National Competition at South Kensington to Miss M. A. Turner, a student in this school, for a study in sepia from the bust of Diana robing (antique). This is the first occasion of an award of a Queen's prize to a student of the Lewes school. Third grade prizes, which it is necessary to explain are of a higher class than those called of the second grade, have also been awarded by the Government Examiners at South Kensington to the under-mentioned students on account of works executed in the school during the twelve months ending April last, viz.:—Misses F. Burley, M. Cozens, A L. Hillman, J. A. Macrae, A. Scrase, and W. C. L Thorp, and Messrs. F. G. Beckett, H. H. Grover, A. J. Lesingham, and W. Taylor. The school is in a very prosperous condition.

THE ANCIENT MURAL PAINTING AT S. ANDREW'S, GORLESTON.—The following are some additional particulars relative to the mural painting mentioned in our last as having been discovered recently during the restoration of S. Andrew's Church, Gorleston. The plaster having been removed, a gigantic figure of S. Christopher was disclosed, bearing on his right shoulder the infant Jesus, the head of the latter being surrounded by a nimbus; the infant Jesus also holds a cup in his left hand over the head of the saint. Beneath are the turbulent waters, through which S. Christopher is striding; on one side is what seems to be a castle, and on the other a hermitage. The head of the saint is very perfect, and the colours bright, but the surrounding objects are not fully uncovered, and are somewhat obscure. Mr. C. J. A. Winter, of Norwich, is engaged in making an accurate drawing of the figures.

BUILDING AT HOVE.—The *Brighton Herald* understands that the owners and managers of the Stanford estate, Hove, propose building 100 houses a-year for the next fifteen years—in all 1,500 new houses. Allowing ten inmates all round, this indicates that the population of the parish will increase by 15,000. But as there are four other estates on which building speculations have been commenced with equal spirit, we may fairly set the computed increase down at 20,000, which added to the 10,000 existing inhabitants and the natural increase in the ordinary way, raises the computation to 35,000. Time must show how far these expectations will be fulfilled. Brighton only doubled its population in forty years.

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General Scott's plan for disposing of sewage in towns was the subject of discussion at a gathering held at Stafford House on Wednesday; the Duke of Sutherland in the chair. There seemed to be a general concurrence of opinion in favour of General Scott's system as being at once cheap and practical

CHIPS.

A fort for the protection of Chatham and the road to London will shortly be erected on Chatham-hill. The greater part of the works will be executed by convicts.

New church schools were opened at Bishopshill, Yorks, on Wednesday. Messrs. J. B. & W. Atkinson are the architects.

A new (Roman) Catholic Chapel, dedicated to S. Joseph, was opened at Dorking on the 3rd inst. Mr. Blount, of Margaret-street, is the architect. The cost is £2,500.

The first stone of the new (Roman) Catholic Church and Presbytery of S. Leonard, Tunstall, Sunderland, was laid on the 10th inst. Messrs. Goldie & Child are the architects.

An new Congregational Church has been erected at Lightcliffe, Yorks, at a cost of £8,500, from the designs of Messrs. Lockwood & Mawson. The style is Geometrical Decorated.

The commodious infirmary, presented to the inhabitants of Banbury by Mr. John Henry Horton, was opened on Wednesday by the Bishop of Oxford. The infirmary stands in thirteen acres of land, abutting the Oxford turnpike road. The total cost of the ground and building is £10,000. Mr. Charles Henry Driver, F.R.I.B.A., of Victoria-street, Westminster, was the architect; and Mr. Franklin, of Deddington, the builder.

One of the piers of the Sutlej Bridge has sunk 3ft. and all traffic is suspended.

The china manufacturers of the Staffordshire Potteries have decided upon an early advance in their prices of china to meet the increased cost of fuel and materials.

Mr. James Byner was on Saturday last elected surveyor to the Hastings Highway Board. There were two other candidates; Messrs. Andrew Munro and James Catt. Mr. Byner received 21 votes, Mr. Catt 7, and Mr. Munro 3.

The parish church of S. Etheldreda, Bishop's Hatfield, having been restored at the cost of the Marquis of Salisbury, has been reopened for divine service by the bishop of the diocese.

The death is announced, at the early age of twenty-six, of Mr. Alfred de Burgho, a draughtsman for the wood engraver of considerable promise. In the Exhibition of Works of Art in Black and White, noticed by us in our issue of the 28th ult., there is a drawing on wood by him—(55) "A Noble Boy," illustrating a story told by Charles Lamb in his reminiscences of Christ's Hospital.

The Newcastle Infirmary has been undergoing extensive improvements during the last three years, Sir Wm. Armstrong being the principal contributor and Mr. Thos. Oliver being the architect.

The foundation stone of a new Primitive Methodist Chapel was laid at Bramley on Saturday afternoon last. The chapel will accommodate about 500 persons, and is to cost about £2,000.

At a recent meeting of the Town Council of Warrington it was unanimously resolved to permit Mr. R. Vawser, engineer to the Corporation, to undertake private practice.

Trade News.

WAGES MOVEMENT.

Blackburn.—For the past few weeks there has been a dispute between the journeymen joiners and their masters. On Thursday week a meeting of the masters and men was held, at which the following terms were agreed to:—The hours of labour to be reduced from 54 to 49 hours per week; the rate of wages to be 7d. per hour; the usual rate of payment as to overtime to remain in force; the new scale of hours and payment to come into operation in the first week in October.

Birkenhead.—On Friday evening last, a meeting of the operative painters of Birkenhead was held. The chairman explained that the committee of the Operative Painters' Society of Birkenhead, at a recent meeting, were of opinion that it was desirable to ask the employers for an increase of wages, but there were some members of the trade who considered the time inopportune, and hence the committee had called this meeting of society and non-society men to ascertain the feelings of the trade generally in reference to the matter. It was unanimously resolved that an advance of wages be asked for; and after some conversation it was decided that the increase be 1d. per hour. It was also agreed to draw up a memorial, embodying the substance of the decision of the meeting, for presentation to the employers.

French Polishers in Leeds.—At a meeting of the members of this society, held in Leeds on Thursday week, it was reported that the men who struck work at Messrs. Marsh, Jones, & Cribb's a fortnight before, were in work with one exception, and receiving, in some instances, more wages than applied for when they struck. The application was for 2s. per week advance, and it was stated that the Sheffield, Halifax, Huddersfield, Dewsbury, and Bradford masters paid 28s. for 54 hours' work, others in Leeds paid 28s. for 56 hours, while the firm named only paid 26s. for 56½ hours, and refused to give the advance because another firm in the town objected to do so. Messrs. Marsh & Co. having made no proposition to the men it was resolved that the shop should be held "black" until the 28s. were paid.

Glasgow Masons.—The strike of Glasgow masons has virtually terminated, the employers having agreed to grant the workmen's demand for weekly pays, and for an advance to 7d per hour.

Intimidation by a Noble Duke.—It is said, by a Bristol journal, that sixteen masons, carpenters, and painters employed on the Duke of Somerset's estate at Maiden Bradley, near Frome, having signed a memorial to the steward of his Grace, asking his consent to leave work at four o'clock instead of five on Saturday afternoons, received on Saturday, June 29th, a week's notice to leave, and at the expiration of the week they all left. Those who occupied cottages belonging to the duke were also served with notices to quit their dwellings.

Leamington.—A meeting of building operatives was held in Leamington on Monday night, to consider the London building strike and lock-out. A resolution was unanimously adopted expressing sympathy with the movement, and pledging the meeting to support the men locked out in their just demands. The action of the masons was characterised as a breach of faith with the other trades; and the importance of a code of working rules, the principal point now at issue, was strongly enforced.

London.—The submission of the masons—in itself apparently partial—seems to have no effect on the other trades. The whole of the trades still out have appointed one general strike committee, consisting of—carpenters and joiners, Messrs. Sinclair & Berry; bricklayers, Messrs. Coulson & Batchelor; plasterers, Messrs. Westaby & Swainson; painters, Messrs. Shipton & Watkin; smith and metal fitters, Messrs. Baker & Wells; and labourers, Mr. Kenny. Nearly all the trades have sent in notices, and on their rejection by the masters, are formally proclaiming a strike. On Saturday the bricklayers' committee struck against three London firms, who are among the largest employers of bricklayers, and issued the following notice:—"To Bricklayers in London.—Fellow Workmen,—The master builders of London having locked out their bricklayers and other workmen, whether members or not of a trade society, showing clearly they have no sympathy for your past services or your wants, other than using you as mere instruments to gain them profit, we therefore appeal to your manhood, and as bricklayers, to keep away from the undermentioned builders' work until the trade obtains a mutual settlement on the nine hour day, 9d. per hour, and code of working rules. Bricklayers, these firms lock out their men; keep away from their works—Messrs. Rider & Son, Union-street, Borough; Messrs. C. & W. Aldin, South Kensington; Messrs. Jackson & Shaw, Westminster. You are free to work at any other firm in London except the above three. Unite and succeed!—E. Coulson, Gen. Sec." On Saturday morning the labourers, of whom about 700 of those originally locked out now remain upon strike, sent in a notice to the masters' committee claiming the nine hours, with a uniform rate of wages at 6d. per hour (the present rate varying from 4½d. to 5d. per hour), and extra payment for overtime. On Monday there was the usual meeting of the General Committee of the Central Association of Master Builders The committee came to this resolution:—"That the employers having agreed to terms of compromise respecting the hours of labour at an increased rate of wages, and the shops having been opened accordingly, the committee of the Central Association of Master Builders will feel it their duty to decline receiving any deputation having for its object the disturbance of this arrangement." The amalgamated trades committee also had a meeting, at which five resolutions were passed—viz., 1. That this meeting of United Trades Delegates do here constitute ourselves into a Central Trades Committee. 2. That Mr. Sinclair be chairman, Mr. Shipton, secretary, and Mr. Westaby treasurer. 3. That we instruct our secretary, Mr. Shipton, to communicate with Mr. Stanley Bird, the secretary of the Master Builders' Association, requesting that a day may be arranged to receive a joint deputation of this committee to confer with the masters on the terms of our memorials with a view to a settlement of the present dispute in the building trade. 4. That the secretary be requested to draw up a circular setting forth the position of the committee, and appealing to the entire country for support. 5. That no branch of the building trade connected with the joint committee shall enter into any negociation with the master builders relative to our present dispute other than through the duly appointed officers of this committee. After this meeting, the following letter was sent to the masters' committee:—"I have the honour to inform you that to-day a Central Amalgamated Committee has been formed of delegates from the following branches of the building trade -bricklayers, carpenters and joiners, painters, plasterers, labourers, and metal workers. I am requested by the committee to express our desire that you will be good enough to arrange some convenient time on an early date for an interview between the Master Builders' Association and a joint deputation from the trades composing this committee, for the purpose of considering the terms of our memorial and working rules, with the view to the settlement of the present dispute." On Tuesday Mr. Bird replied as follows:—"In reply to your note of yesterday, I have to draw your attention to the resolution of our committee of master builders passed yesterday. You request an interview with a view of considering the terms of your memorials, which memorials have been fully considered already at lenthened interviews with deputations from the carpenters and joiners, and also the masons. If you think it desirable to put in writing any distinct points you think have not been considered already, I will lose no time in laying such an application before my committee, whose next meeting will be on Monday next. I beg to remind you that no lock-out exists in London at the present time." During the day the carpenters and joiners held a meeting, at which the following resolution was passed:—"That in consideration of the position in which the carpenters and joiners of London are placed by the resolution of the committee of the Central Association of Master Builders, passed by them on Monday last, we, the delegates of the trade, are of opinion that no further efforts be made upon our part to effect a settlement, but that we maintain our present position, believing that by so doing a speedy and satisfactory settlement will be arrived at." The Plasterers' Committee have issued a notice, stating that in consequence of the unsettled state of affairs in the building trade, and the number of men still on the funds, the levy of 3s. per week will be continued until further notice. On Wednesday, at another meeting of the Amalgamated Trades Committee, it was unanimously resolved that a mass meeting of the London trades be held in Hyde Park, on Saturday, the 27th inst., at five o'clock in the evening. The bricklayers held their "aggregate" meeting on Wednesday night, to "consider the unjust lock-out of the master builders in London, and their proposed settlement; also, whether united efforts shall be made to obtain the nine-hour day, ninepence per hour, and a code of working rules." The Secretary of the Operative Bricklayers Society explained what had occurred between them and the Central Association of Master Builders. The masons' agreement was returned as a reply to their memorial, and they answered this was most unsatisfactory, requesting that six employers should be appointed to meet six bricklayers to talk over the question. That request was met by the masters forwarding their resolution not to receive any deputations. Thereupon the Society "struck" three firms—viz., Rider & Son, C. & W. Aldin, and Jackson & Shaw's, and as far as they knew the men had all come out. Mr. Chas. Thompson moved, "That we, the bricklayers of London, in public meeting assembled, fully endorse the action of the executive council, and pledge ourselves to give them every aid and support, and to co-operate with them in their endeavours to obtain the nine hours day, the code of working rules, and the 9d. per hour." There were, he said, 20,000 bricklayers in London, and it was deeply to be regretted so few of them had attended to assist this movement. The resolution was carried unanimously, after which Mr. Coulson gave an outline of the code of rules he wished to see adopted. One rule distinctly provided for shorter hours in winter than summer, and another that no alteration should be made in the code without six months' notice; all disputes relative to the rules to be settled by arbitration. Such a code, he said, existed in every town but London, and as it would be as much for the interests of the masters as the men that a code should be established, he was not without hope that the committee of the Central Association would reconsider their determination not to receive a deputation on the subject. A proposal was made that the men should be called out from all the firms in the Lock-out list; but it was explained that that was an impossibility, as not 1,000 out of the 20,000 bricklayers in London belonged to the Trade Union; otherwise the thing would have been easy enough, and its success assured.

Preston.—The operative masons of Preston, and those in the neighbourhood in connection with the Union, are out on strike for an advance of 6d. per day.

Tamworth.—The joiners employed by the London and North-Western Railway Company, at Tamworth, struck work on Friday last for an increase of wages and a reduction in the hours of working. About 18 weeks ago the men made application to the company for a rise in their wages of 6d. per day—namely, from 4s. 6d. to 5s., and for the working hours to be reduced from 57½ to 54½ per week—Sunday work to be paid for as double time. On Wednesday week an answer was received by the men from the railway company, refusing to grant the advance of 6d. per day, or to reduce the hours of working. In consequence of this, the majority of the men turned out, and are now on strike.

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Ashton & Green, Slate, Iron, and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

TENDERS.

Berks.—For the erection of new schools and master's residence at Stamford-in-the-Vale, Berks. Mr. W. Pen stone, architect:—

Wheeler	£1254
Newcombe	1228
Bartlett	1180
Honor & Castle	994
Williams (accepted)	932

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 26, 1872.

SIR RICHARD WALLACE'S COLLECTION AT THE BETHNAL-GREEN MUSEUM.—III.

THERE are not many English oil paintings in the galleries at Bethnal Green, but what there are, are mostly good and characteristic. Of the two Gainsboroughs, little Miss Boothby dressed up in her mother's clothes is the prettier. It is a very clever picture, and in colour as good as when painted. Would that we could say the same of most of the portraits by Sir Joshua Reynolds. The famous Nelly O'Brien is too well known to require further mention. The most original, as the artist himself considered, saying that "it was one of the half-dozen of original things" he had produced, is that commonly called the "Strawberry Girl." The success with which the wonderful brightness and expression of the little creature's eyes has been caught is to be met with in few portraits even by Sir Joshua. There is a charm about the whole which removes it out of the ordinary category of portrait painting. No. 7, Miss Bowles, is another charming picture of a little girl, not so powerful as No. 20, though it makes a good companion to it. Nos. 28, 30, and 31, are very remarkable for their fine condition, and should be studied, as they give the key to what many of those whose carnations have faded or perished altogether were like when first exhibited. "Frances, Countess of Lincoln, daughter of the first Marquis of Hertford" (31), is the best of the three. There are few small portraits of Sir Joshua Reynolds superior in all great qualities to the portrait of Mrs. Braddyll. There is an extraordinary refinement about this painting. (17) Mrs. Hoare, is a larger and more important work, but it has lost much of its freshness through change of colour, still it is a lovely work of art; if it had remained uninjured by time it would be almost the most valuable of this artist's works shown in the collection. Notwithstanding its faded condition, few portraits ancient or modern surpass it. The child is unsurpassable. There is one more fine portrait which must not be passed over, (5) a "Portrait of a Lady," by Gainsborough, which should be compared with a similar portrait by Sir Joshua hanging close to it. Any one who chooses to do so may see the distinctive beauties of each master. It is a matter of surprise and regret that hitherto no one has been able to identify this beautiful portrait. There is a marvellous freedom and lightness in the touch throughout. There is only just as much paint as was actually wanted. Gainsborough was never more successful in imitating the various textures. Sir Joshua would have done the same, but in a much more elaborate and heavy manner. By Sir David Wilkie there are two well-painted small pictures in his less finished style; No. 14 is of very high character, and No. 15 bright and spirited. There are two also by Hoppner, each worth looking at. No. 19, though without the consummate skill of Sir Joshua, and the delicacy of Gainsborough, is a wonderfully firm and powerful head—in very pleasing contrast to the meretricious, affected style of Sir Thomas Lawrence—of which No. 22 is a fair example. James Sant has a carefully painted "Portrait" (34), though very lifeless when compared with the others we have mentioned. There are several fine pictures by David Roberts. Perhaps the most elaborate and important is (40), "The Church of S. Omar;" but the colouring is somewhat tame, probably faded. No. 32 is a smaller piece, but decidedly better painted in every respect. There is more atmosphere, and the colouring is richer and truer. Few groups of cattle by T. Sydney Cooper are better than No. 41. It is a beautiful circular painting in his very best style. He seldom does anything so good now. The whole picture is perfect. The tree at the left hand and the foreground are very skilfully done. It is as fresh, crisp, and bright as possible. There seems, however, to be an unfortunate change in the glazing. It may only be the varnish, but it appears to be some material used in the last finish, which is now a dark yellow, and will doubtless become much darker still in course of time. It is a grievous pity that artists will use doubtful materials to gain a temporary apparent perfection of finish. There is an elegance and poetic feeling about W. Hilton's "Venus appearing to Diana and her Nymphs" (35). The drawing, however, is feeble, and the colour unnatural. The only picture by Stanfield, "Bacharach on the Rhine," also strikes us as too uniform in colour. It is, however, powerfully and beautifully drawn. We now pass on to the works of Richard Parkes Bonington, who, dissatisfied with the estimation in which he was held in England, emigrated to Paris. He was born in 1801, and died in 1828, and is best known in England as a landscape painter; but he was by no means confined to one branch of his art, as is proved by the present very important exhibition of his pictures in water-colour and oil. Few Englishmen have equalled him in versatility and power of colour. The best examples of his talent for rich colouring are (45) "Henry IV. and the Spanish Ambassador;" and (50) "Henry III. (King of France 1574—89) receiving the Spanish Ambassador;" in both the story is admirably told, and the colouring quite equal to Delaroche's best, whose works they somewhat resemble, though they are more dashing and characteristic. We wish there had been more elaboration in working out the details. There are examples of almost every kind of painting. (48) "Venice," will well compare with D. Roberts's work. It is almost as bright as Canaletto, without his dryness. (51) "The Seine near Rouen," is a charming bit of quiet water under the rich glow of the setting sun. (49) "Landscape with Timber Waggon," though small in scale, might well be set alongside with Constable's work. One of the best things of this kind is (46), "The Seashore—a Ship Aground." It is a very true description of chalk cliff and down, with the sea lulled after the storm. We must not omit No. 47, a good picture of Sir Edwin Landseer. What a contrast is here to the feeble sketches of this year's exhibition.

Much of the excellence of the French school will not be greatly appreciated by our countrymen. There is a great deal of work in which we Englishmen either take no interest or can only imperfectly understand and enter into. The most thoroughly French artists in feeling and expression are doubtless Bouchet, Fragonard, Pater, and Watteau, to which we may add Watteau's contemporary and imitator, Lancret, whom he copied with considerable success, though he never, as far as we know, in a single instance came up to the excellence of his great master. John Baptist Pater also imitated his master, with what success our readers can judge for themselves in the present collection. Neither can compare with Watteau. Few Englishmen had an idea of his greatness, as shown here. The power of the man is enormous, especially in drawing the figure. The landscapes, charming as they are, leave most of the detail, even of the foreground, to the imagination. Two on the largest scale on the outside wall of the west gallery are also in his finest style. (402) "Landscape with Pastoral Groups," is, perhaps, the best, though it has rather suffered from cleaning. The taste for music of the period must have been curious, one group is listening, apparently with pleasure, certainly without strong dislike, to a hautboy, accompanied by a hurdy-gurdy. There are many other fine works of this master, among which we may mention as most worthy of note (422), "Sentimental Promenaders" — walking amid fountains and leafy groves, a delightful picture; (434) "A Loving Conversation"—very powerful, with fine harmony of colour; the man at the right hand playing the guitar is wonderfully drawn; the figures, also, in half shade are very clever; and (452) "Gilles and his Family," the strongest piece of drawing in the series. (416) A large "Pastoral Group," by Laneret, will be a good example to compare with the works of the last-mentioned artist. It is well coloured and pleasing, but coarser in subject and treatment, and altogether inferior to his master's painting. There is one sweet little thing (439), which is more like Wilkie: "A Girl in a Kitchen," surrounded by pots and pans, finished with the elaboration of D. Teniers. Nos. 449 and 450, group of maskers and group of bathers, are both good; (462) "Portrait of an Actress" is as good as anything by this painter. By Pater there are fifteen landscapes, all something in the style of Watteau, but weaker. He has considerable power of representing texture naturally. One of his best is (426) "Seaside View with Figures;" (432) "Pastoral Group," is also worthy of observation. The most pleasing piece from Fragonard's easel are (445) called the "Schoolmistress," a pretty fanciful piece, very carefully executed, and (481) "The Garden of Chateau de Fontainebleau." It does not come up to the best English or Dutch landscapes, because both in colouring and design it is very artificial and proportionately untrue to nature, but, notwithstanding, it is interesting as a choice specimen of French taste, which is always more or less artificial. We must not forget to mention that there is a particularly fine landscape by Gaspar Poussin (407), and a most delightful one by Claude (92). It is very seldom that one has a chance of seeing so perfect and high-class a painting by this master; we have seldom seen so good a specimen; the figures and foreground are remarkably good for him.

Greuze was certainly never so well represented before in this country. Without altogether liking this very highly-prized painter's works, it is impossible to deny his amazing power of expression and colour. No one else has ever painted such pearly teeth, such rosy lips, such languishing blue eyes, rivalling the azure of the sky. One of the most interesting, because his usual affectation is entirely absent, is the portrait of Sophie Arnould, actress of the Théâtre Français, Paris. This is a capital picture. In his usual style the finest are (447) "Innocence," which is really innocent and pure, and (380) "A Nymph sacrificing to Venus." There is also an excellent figure-subject called the "Broken Eggs" (468), with a good deal of humour in it. The pouting young lady, who seems to have been the first cause of all the mischief, is as well painted as anything from his pencil. Of all the artificial painters in Europe Boucher goes the farthest. There is not a single example with the slightest attempt at being natural—still, as decorative pictures, in rather a questionable taste, they hold a high place. No. 408 is a characteristic example. "A Lady and Milliner" (421) is less unreal, and, in fact, one of the best exhibited; very quiet in tone, almost to hardness. Those who like the works of Horace Vernet can see them in all his styles. His best are scenes from Eastern life, among which we must notice (329) "Judah and Tamar," and (338) "The Brothers Dipping Joseph's Coat in Blood." His worst are French scenes—(326) "The Soldier turned Ploughman," and (633) "Marsh Shooting," are among the weakest. By Baron de Leys we have two pictures, one in his early style (327), very dark. The best part is the back, which much resembles Metzu. The other is (593) "Coming to a Feast," a most perfect resuscitation of sixteenth century Germany. It will be impossible to give more than a glance at the important and valuable series of the paintings of Decamps. As a colourist few have equalled him. His love for the horrible and picturesque is thoroughly French. One can hardly imagine the good of representing so dreadful a scene as (328) "The Execution in the East," though there is no question of the masterly hand with which the sickening subject is treated. Altogether as pleasant as this is repulsive is No. 337, a capital Eastern scene. All his scenes in the East are good; Nos. 482, 487, and 498 should not be passed over. Prosper Marithat is another faithful delineator of this description of scenery. No one visiting the Museum is likely to pass over the two pictures by Ary Schoeffer, the finest, as it is among the very greatest of all modern paintings, being "Dante's Francesca di Rimini." Schlesinger's "Five Senses" are also sure to have their full share of attention. De la Roche's works are both numerous and important. The finest in many ways, in fact, nearly the most religious picture in the place, is (365) "The Repose in Egypt"—the beauty, grace, and *pose* of the sleeping babe are exquisitely lovely. 572 and 579 are also delightful. "The Princes in the Tower," of which there is a highly-finished drawing, is a good exposition of the sad story.

In conclusion, every one should carefully examine every painting by J. L. Meissonier. His style, uniting the highest finish of the Dutch school with a very considerable breadth, is quite his own and perfectly original. Small though they are, every one is worthy attentive study. No school has produced a more masterly picture in its way than the "Murderers Waiting for their Victim." If we may select from so choice a collection, we should direct our readers to Nos. 540, 549, 585, and 587. These pictures alone are worth going miles to see.

Visitors to Bethnal Green should not pass over the water-colour drawings, some of which are of the highest quality.

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S. STEPHEN'S CHURCH, HAMPSTEAD.

MR. S. S. TEULON has achieved a very remarkable work in his church dedicated to S. Stephen at Hampstead. The site is a fortuitous though peculiar one, and it has been happily treated. It has a great slope from west to east, and the lofty apse to the chancel, transepts, and tower, which is placed over the western part of the chancel, are strikingly elevated in consequence. The tower has a projecting turret at one angle, and is capped by a high pyramidal roof with a chisel edge, with a bold finial to one of its points only. The material is a peculiar dull red local brick, which contrasts well with the green of the fine trees around, and relief is gained by free mixture of gray stone, and the freestone of the dressings. The nave has a stately range of large clerestory traceried windows, the easternmost of which is carried up as a dormer, and the aisles have wide square-headed traceried windows. The western end has a two-storied narthex, on open arches below, and vaulted, but rather low, and above is a gallery open to the church; this is flanked by great buttresses carried up to the nave walls bearing statues, and a considerable amount of carving is introduced, as heads projecting from circles in the spandrels on the north side, and half-length figures of angels in the corresponding positions on the south. There is also a picturesque panel of sculpture in a prominent position near the east end on the north. This profusion of figure-carving is unusual, and the general *motif* of it is certainly good, though somewhat pretentious; the execution is not equal to the ideal, and it would be difficult to dissect the anatomy of some of the figures, and many pleasing faces would be found protruding from very questionable bunches of clothing. We question, also, the desirability, on the score of a too-probable lack of durability, of such delicate and high relief as that given to many of the figures. A great rose window fills the west end above the narthex we have spoken of. The outline of the buttresses to the apse is unpleasant, and the projection of this part of the chancel beyond the tower insufficient; an extra bay would have been of great advantage. Still, the exterior of this church, although wanting in repose and open to criticism, is unquestionably a very finely-conceived and boldly-executed work. Inside there is also much to admire; but here restlessness is more apparent, together with a certain want of refinement. The height, also, which forms so marked a feature outside, is missed within, for the main arcades have been sacrificed to the clerestory. There are six bays with pointed arches, resting upon monolithic shafts of red Mansfield stone, with white freestone caps and bases. The bases are raised above the level of the seats, and are queer rather than good, the circular form intersecting with octagonal plinth, with somewhat nondescript mouldings. The capitals are novel and striking, somewhat coarsely yet freely executed from varied designs of unusual character, which may be described as Byzantine in form and Early Gothic in detail. All the basket and tulip types, and many others besides, familiar to us from the manner in which Mr. Ruskin lovingly dwelt upon them, are to be traced, and the whole form a pleasing and interesting collection. We may, in passing, also speak with commendation of many of the capitals in the narthex. The arches of the main arcade are of brickwork, with the alternate bricks at the angles chamfered and square, and a sort of label is formed by the chamfered bricks set, first with the chamfer placed outwards, and the next reversed, and so on, to imitate the notched borders or frames of Venetian architecture. These are harsh and distressing—a mere parody of the delicate marble work of the kind in Venice. The labels come down upon rather shapeless carved blocks as terminations, of which the foliage is pure naturalesque, but coarsely executed, and these do not at all harmonise with the capitals. The chancel arches under the tower are of the same character, but their uncouthness is intensified by their being carried horseshoe-wise below the springings, and these arches again are borne by coupled massive shafts of red Mansfield stone, their bases resting upon great corbels of stone projecting from the piers. All this treatment gives the appearance that these transverse arches are thrusting out the piers. Another offending peculiarity is that the vaulting of the crux meets at the crown with a circular opening, the moulding round which follows the arched form of the pockets of the vaulting, and appears from the nave strangely distorted in consequence. The apse as well as the crux is vaulted, this portion very pleasingly, being enriched with narrow bands of mosaic of alternating golden and blueish gray tints. The stained glass is spotty and not particularly good, and the reredos consists of a band of enriched panels in a band of alabaster set within lines of blueish gray. These several features are tolerably well in themselves, but form no picture as a whole. Altogether, with much that is interesting and well-designed, the interior is comparatively ineffective and unimpressive. Mr. Teulon needs to curb his fancy, and to seek after refinement and general effect, but his vigour and power of design is unquestionably great, and again we repeat that, in this Church of S. Stephen at Hampstead, he has produced a thoroughly original work, one which is truly noble in many important respects.

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THOMAS BRASSEY.*

FORTUNATE above many is the great contractor Thomas Brassey in his biographer. The author of "Friends in Council" is no mere compiler of dates and events, but lingers over the memory of his departed friend—"the employer of labour after her Majesty's own heart," as he calls him in his dedication of the book to the Queen, as if his work were indeed a labour of love. Mr. Brassey needed no memorial; he built himself enduring monuments in both hemispheres, whose greatness only indicates the character of his whole life's work, and to such men as he, Literature, as a rule, can bring but little additional renown. The soldier and the statesman often need that their fame shall be perpetuated in song and story if it is to last long beyond the limit of their own lives, but the builder or contriver of great schemes that change the character of the earth's surface and shape the destinies of its inhabitants needs no memorial but his work. The benefit of a faithful biography of such men is for their fellows, who experience it in a greater or a less degree in proportion to the ability of him by whom the task is essayed, and it is for this reason that we, whose record of the achievements of such lives is but ephemeral, are glad now and then, as in this instance, to welcome a life-history worthy of him of whom it is written.

Mr. Brassey was born on the 7th of November, 1805, at Buerton, in the parish of Aldford, Cheshire. His father was of an ancient family whose founders came over with the Conqueror, and which had for nearly six centuries resided at Bulkeley, near Malpas, in Cheshire, on a small landed property of three or four hundred acres. They moved to Buerton more than two centuries ago. Mr. Brassey, on leaving school, was articled to Mr. Lawton, a land surveyor and agent, and was by him permitted to assist in the survey of the celebrated Holyhead-road. At the age of twenty-one his employer took him into partnership and sent him to Birkenhead to superintend the branch of the business recently established there. On Mr. Lawton's death, Brassey was left entirely to himself. After a residence in Birkenhead of eight years he accidentally became acquainted with George Stephenson, a circumstance which gave the colour and direction to his future life. Acting on Stephenson's advice he made an unsuccessful tender for the erection of the Dutton Viaduct, near Warrington, on the Grand Junction line, which now forms part of the London and North Western system. His next tender was for the Penkridge Viaduct between Stafford and Wolverhampton, including a length of ten miles of railway; this he obtained and completed successfully.

On the completion of the Grand Junction Railway Mr. Locke, who had succeeded his master George Stephenson as engineer-in-chief of the line, was employed on the London and Southampton Railway, and under his direction Mr. Brassey undertook the construction of important works on that line between Basingstoke and Winchester, and in other parts. His connection with this railway brought him up to London at the age of thirty-one years; he had some five years previously married a daughter of Mr. Joseph Harrison, the first resident in the then new town of Birkenhead, who carried on business as a forwarding agent, and who was one of the few persons clearsighted enough to foresee the advantages that would accrue to the commerce of the country by the adoption of the railway system. Between him and his son-in-law a considerable amount of sympathy existed, and to his marriage possibly Mr. Brassey's first connection with railways was due. ."He naturally hesitated," says Mr. Helps, "to leave Birkenhead, where he had established a large and increasing business, but his wife's spirit and sound judgment convinced her that her husband would be able to find a far more important sphere for the exercise of his great abilities by enlisting in the small band of men who had at that time taken in hand the construction of railways."

With the commencement of the railway system began an age of great works rapidly projected, and requiring to be as rapidly carried out. The extended railways called for larger docks and harbours, and Mr. Hawkshaw tells us that since the construction of the Liverpool and Manchester Railway, the public works that have been executed in the United Kingdom alone far exceed all that had been done before. This enormous amount of work was performed by a new agency, that of the "contractor." The need and value of this system of contracting for the execution of great works is shown by its perpetual tendency to extend itself. Thus the original contractor sub-lets portions of his contract, which are again sub-let to smaller men, and thus individual skill and exertion are developed to their uttermost. Of the contractor Thomas Brassey was eminently the type, and his method of work produced the best possible results, and is presented to us in its most advantageous aspect, because the work he had to perform was just that kind which may best be executed by contract. Definite in its character, and requiring the co-operation and skilful direction of armies of workmen, railway construction is only to be successfully and economically carried out by this method. It is interesting, too, to note with Mr. Helps what advantages have accrued from the contract system in the execution of foreign work, both to the countries in which the works were performed and to the country in which the projects were originated, from the works being confided to contractors who carried hither and thither bands of skilful workmen, and who indirectly brought much profit to the mother country while gradually instructing the natives of other countries in skilled labour. If proof of this were wanting, it is to be found in the early contracts undertaken by Mr. Brassey for the construction of the French railways.

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* Life and Labours of Mr. Brassey. By Arthur Helps. London: Bell and Daldy.

Great Britain had been fortunate in her inland means of communication by roads and canals, which had been brought to a state of comparative perfection before railways were thought of. These minor modes of transit wonderfully aided the construction of the railways, and when finished led traffic up to them, and aided their development. In France and other continental nations it was otherwise. In France especially were good roads wanting, and canals were hardly known, so that the French had even greater reason than ourselves to welcome the introduction of railways. There appeared, however, but little chance of the system being introduced as a purely commercial speculation, and the Government, therefore, adopted the plan of giving guarantees to those who were willing to become railway shareholders. The first line thought of was one which should connect Paris with London. Hence arose the Paris and Rouen Railway Company. A proposition made by the French Board was favourably entertained by the directors of the London and Southampton Railway, and ultimately a joint company was formed, the English shareholders stipulating that they should appoint the engineer. Mr. Locke was chosen, and speedily repaired to the scene of his labours. The pretensions of the French contractors were so much in excess of his expectations that he suggested the invitation of English contractors to tender in competition with those of the country. Several of the principal contractors in England were accordingly invited to examine the projects of the works with a view to tendering for their execution. Of these Mr. Brassey and the late Mr. William Mackenzie were the only two who seriously entertained the proposition; they wisely agreed to join, and the French contractors were nowhere. They tendered conjointly for the contracts as they came out, and secured the execution of almost the whole of the work. The line was commenced in 1841, and opened to the public in May, 1843. Mr. Brassey resided on the line, and gave to its construction the whole of his time and attention. To the usual obstacles were added, in this instance, the impossibility of securing practical agents and foremen, or even labourers and navvies used to the work; numbers of workmen of all classes, amounting at times to several thousands, had to be brought over from England, and the difficulty of getting these men to work with the natives employed was increased by their ignorance of each other's language. "Their mode of instructing the Frenchmen working under them was at first," says Mr. Helps, "of a very original character. They pointed to the earth to be moved, or to the waggon to be filled, said the word 'd——n' emphatically, stamped their feet, and somehow their instructions were generally comprehended." This, however, only sufficed in simple instances, and ultimately there grew up among the navvies a sort of Hong Kong "Pigeon English," which could hardly be said to be either French or English, and probably owed something to other tongues, for we find that on the railway between Paris and Rouen no less than eleven languages were spoken—viz., English, Erse-Gaelic, Welsh, French, German, Flemish, Dutch, Piedmontese, Spanish, and Polish. The lodging and management of this motley army of sometimes as many as twenty thousand men demanded in itself no small amount of care and foresight.

In 1843 Mr. Brassey commenced the Rouen and Havre Railway, a continuation of the Paris and Rouen line. The works here were of considerable magnitude, and hosts of bricklayers had to be brought over from England. It is stated by Mr. Helps that brickmakers and bricklayers are the worst and most unscrupulous of all classes employed on railway labour, and consequently great trouble and anxiety is occasioned to the engineers as well as to the contractors. During the progress of the works a great accident occurred in the fall of the Barentin Viaduct, a huge brick construction, 100ft. in height, and about one-third of a mile in length, which had cost some £50,000. This occurred only a short time before the period fixed for opening the line. Mr. Brassey and his partner met the difficulty manfully. "The first thing to do," said they, "is to build it up again," and build it up again they did in the incredibly short space of six months. Somewhat flattering to our national vanity are the opinions formed by the French as to the capacity of the English navvies for work. "Mon Dieu!" exclaimed the French who came to see them work, "les Anglais comme ils travaillent." Another thing equally strange to the French was the complete silence that prevailed amongst the Englishmen.

A very inadequate idea of the work performed by Mr. Brassey and his agents is obtained from the projects actually carried out by them. A large part of his and their work consisted in making calculations respecting the different schemes put before him, many of which came to nought; at least, so far as he was concerned. Mr. Helps is informed that Mr. Brassey tendered unsuccessfully for works to the amount of nearly £150,000,000. The calculations involved in an amount of work like this could only have been performed by one possessed of high arithmetical powers and of a good memory. Mr. Helps observes of Mr. Brassey that "he never condescended to that weak practice of making many notes." He relied, like almost all other men who have been worth anything in the world, on his memory alone, a facility never to be acquired by those who rely upon written memoranda.

It was well for Mr. Brassey that his brain was clear and his memory all-grasping, for the work that now began to crowd in upon him was of a nature to tax both to their very utmost. In 1845 he had on his hands no less than thirteen heavy contracts, which alone represented a length of about 800 miles, scattered in various parts of Scotland, Wales, France, and England. Henceforth his work necessarily consisted less of detail, but became by no means less arduous. His whole mind was in his work; he was, as he said, "a contractor for public works and nothing more." He steadfastly refused all offers to bring him into Parliament, and honours of all kinds had little attractions for him. In projects of public utility, such as steamships, mines, engine factories, marine, and telegraphs he took a lively interest, and in many cases a prominent part and large pecuniary interest.

One of his most important home projects was the formation of the Great Northern Railway, commenced in 1847. In this the co-operation of Mr. Stephen Ballard, brought about by a chance introduction at the Cambridge Railway Station, proved of considerable advantage. The character of the Fen country, through which a great part of the line had to pass, presented difficulties readily appreciable by any one acquainted with the district. Of one bog which at that time existed Mr. Brassey well said, "You could stand upon it and shake an acre of it together." Its depth was no less than 22ft., and it extended on a level for about three miles. Mr. Ballard divided the country with which he had to deal into three districts, the conclusions at which he arrived with respect to each being at once adopted by Mr. Brassey. One portable engine suitable for the work had been made by the firm of Clayton & Shuttleworth. It took them about six weeks; they now turn out four a day. This had been sold to a farmer, from whom by payment it was again obtained. The next step was to provide a large quantity of faggot wood. A platform was constructed of the stakes thus cut, upon this a layer of peat sods was placed, and so on alternately, until a kind of solid raft was formed, on which the dry earth was piled. This gradually sinking displaced the water, leaving only the solid parts behind; in Mr. Ballard's own words: "The effect was to displace the water. * * * This is not done by suddenly adding a great weight, but by a gradual and slow increase of weight, so that the water has time to escape without carrying away with it the solid matter. That plan succeeded, and you may go to any height you like if you treat peat in that way."

We necessarily pass over much that is interesting in Mr. Help's narrative in the desire to view Mr. Brassey in a new light—fighting against financial troubles. In the year 1866 he had incurred liabilities in connection with Victoria Docks to the amount of £600,000; he was also jointly responsible with Messrs. Peto & Betts for £800,000 on account of Danish Railway engagements; he was heavily involved in the Lemberg and Czernowitz line; the shares of the Evesham and Redditch Railway, with which he was entirely paid for work done, were lying dead on his hands; the settlement of claims due from the Queensland Railway Company was delayed, and numerous smaller matters, each in itself vast enough to trouble a man of more than moderate capital, were pressing upon him. Such a man, however, was sure to have made friends, and they were not wanting to him in this crisis. Mr. Wagstaff especially is mentioned as having rendered him good service. The old characteristic of undaunted resolution was very strongly manifested in the midst of all Mr. Brassey's troubles. Many friends advised the delay of the Lemberg and Czernowitz works, requiring, as they did, a monthly outlay of over £40,000 for wages. Still, he would go on, and well he did so; for he had to pay the interest of the shareholders, amounting to something over £120,000 per annum, until the work were completed. Instead of being completed in January, as contracted, the line was finished in the previous October. This added to his *prestige*, and to a large extent relieved him from his monetary difficulties. These difficulties had been all surmounted before his death, and the large fortune left behind him was altogether free from any claims. Of his liberality, some idea may be gained from the fact, that during his life he gave away about £200,000.

In 1867, and again in 1868, the first symptoms of his fatal disease attacked him. He rallied slightly, and the last days of his life were spent at Hastings. There, on the 8th of December, 1870, he departed, after much suffering, leaving behind him his widow, and three sons all worthy of their father.

We have no space even to glance at the appendix, in which Mr. Helps has grouped letters which passed between Mr. Brassey and his friends. Those who would read these, and who would know more about his Canadian, Australian, and South American works, should read the book for themselves.

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CRITICAL NOTES ON GREAT ITALIAN ARCHITECTS.—XVI.

By J. B. Waring.

GALCAZZO ALESSI AND BARTOLLOMEO AMMANATI.

TWO architects of the sixteenth century adorned the cities of Genoa and Milan, Florence and Rome respectively, with works of unusual merit; yet excellent as they are, we do not think their authors have generally received the credit they well deserve. These are Galcazzo Alessi, to whom some of the finest buildings of Genoa are due, and Bartollomeo Ammanati, of Florence.

Alessi was born of a good family at Perugia, A.D. 1500. In his youth he was attached as chamberlain to the service of the Cardinal of Rimini, by whom he was employed in the construction of various architectural works, amongst which some additions to the citadel of Perugia obtained for him great repute both for style and the commodious arrangement of the apartments. According to Milizia, he studied architecture and engineering under Giambatista Caporali, of Perugia, a translator and commentator of Vitruvius; and his reputation became so widely extended that he was invited by the Republic of Genoa to restore and extend the port and its fortifications. His plans were made on a large scale, and the style of architecture adopted is grand and massive, well suited to the nature of the work. The Doric order is principally used by him, of which the gate of the old "Molo" is a fine example. He erected also a portico of the same order between the harbour and the city for the accommodation of the guard, as well as very substantial platforms, &c., for the use of artillery. Besides these important works, he made a model for the re-arrangement of the city itself, and the Strada Nuova, planned by him in 1552, full of palaces, mostly of his design, is still one of the finest streets in Europe. Amongst them are to be named the Palazzo Serra, now much altered and re-decorated; the Grimaldi, now the Spinola, Palace, a large building in a bold and effective style, with a fine staircase; the Lercari Imperiale, one of his best works, and decorated with some excellent arabesques by the Genoese painter, Taddeo Carlone, executed under Alessi's direction; the Palazzi Adorni Carega and Centurione, all these being in the Strada Nuova. In other parts of the city he erected the Palazzo Pallavicini, of excellent design, ornamented with several fountains; the Sauli Palace, one of his *chef d'œuvres*, a plain building, but of excellent proportions; two or three for the Grimaldi and Somellini families; the Villa Imperiale at San Pier d'Arena, very good, rich and massive, with well-arranged gardens; and the white marble grotto in the garden of the great Doria Palace, a small Doric building, with well-designed staircase leading to a terrace, which forms a pleasant promenade. In the neighbourhood of the city, on the beautiful hill of Albaro, is the Villa Giustiniani (now Cambiaso), which is considered a masterpiece, especially as regards the arrangement of the loggia; the Villa Pallavicini, near Zerbino, and the Villa Grimaldi, at Bisagno, in which he designed a bath, which is described by Vasari. It was circular on plan, with a central basin, the descent to which was by steps, and capable of holding eight or ten bathers commodiously. It was supplied with hot and cold water, and was surrounded with single baths, each furnished with hot and cold water. "From the centre of the ceiling hangs a large ball of crystal, on which is depicted the celestial sphere, and within this is the globe of the earth, from various parts of which proceed lights to illumine the bath when any one desires to use it at night; these lights render the whole building as clear as at mid-day." This bath was also furnished with ante-room, dressing chambers, &c., and beautifully decorated with paintings and stucco work.

Besides the buildings enumerated, Alessi designed in Genoa the Church of S. M. di Carignano, built in 1552, a Greek cross in plan, surmounted by a fine central dome; the Loggia de' Banchi, a kind of Exchange, consisting mainly of a large hall 110ft. long and 60ft. broad, of very good architectural effect, and remarkable, moreover, for the ingenious construction of its roof. Other works of minor importance by him are scattered throughout the city. The next important works by Alessi are to be seen at Milan, where his art is well represented at S. M. Presso San Celso, a very fine building, and one of the principal churches in Milan. It was commenced by Bramante, but the façade is due to Alessi, and the very beautiful stalls of the choir were also designed by him. The Church of San Vittore, vieing in importance with the Cathedral, was built from Alessi's designs in 1560, and its interior is, perhaps, one of the finest examples of vaulting combined with stucco work and painting we could point out, the subjects being admirably adapted to their places, and exhibiting some of the best work of the later artists, such as Daniele, Crespi, il Moncalvo, A. Figino, the Procaccini, Salmeggia, &c. Besides the auditory "del Cambio," he designed the great Marini Palace, one of the finest examples of civic architecture in Milan. We also meet with his name in the list of architects employed or consulted on the erection of the Duomo about the year 1550, in Franchetti's, "Storia del Duomo," &c. At Bologna he designed the principal entrance of the Palazzo Publico, and was engaged on the Palazzo del Instituto, commenced by Pellegrino Tibaldi; at Cittâ del Pieve he built a magnificent palace for the Duke della Corgna, and was employed with Giulio Danti in completing the Church of Madonna degli Angeli, near Assisi, commenced by Vignola. Late in life he appears to have revisited Perugia, where he was received with high honour, and was employed by the Municipality in an important political mission at Rome. He designed buildings also for the cities of Ferrara and Naples, for France, Germany, Portugal, and Flanders. He was knighted by the King of Portugal, and executed some works in Spain, which country he visited at the King's request, and prepared a design for the Escurial, which was preferred to all others, but owing to his age and ill-health he was unable to attend to it, and at his death in 1572 it appears to have been put aside. "Besides his great palaces at Genoa he left," says Milizia, "a number of designs and models which have been executed at various times by the rich nobility." Thus his edifices have obtained for Genoa the title of "La Superba," a title to which the later palaces, such as the Durazzo Balbi, and Doria Tarsi, gave it a still more notable claim—palaces which so excited the admiration of Rubens that he studied them personally and published several of the most remarkable as being models of palatial style. Though the cotemporary of Vignola (1507—1573), who gave such an impress generally to architecture in Italy, the style of Alessi is much more bold and pictorial; he had a good eye for effect and proportion, and made the most of his space, which was often restricted. His buildings look larger, indeed, than they are really; in some cases, perhaps, this may be owing to the narrowness of the street in which they are placed, but as a rule he designs with breadth, and gives the idea of largeness by his treatment of mass and detail. He affects the use of two orders, the lower Doric, the upper Corinthian, by which he obtains massiveness at the base and richness in the upper portion of his designs; and he has left his impress—and that a very striking and agreeable one—on Genoa almost as much as Palladio on Vicenza and San Michele on Verona.

The style which he adopted, and which was followed to a great extent in subsequent buildings, though not distinguished by refinement of detail, deserves careful attention, and may be most usefully studied. The effect obtained in these palaces is very fine, with their grand doorways, courtyards, entrance staircase and loggie, with a judicious employment of painting and sculpture, the arrangement of the garden and fountains, all of which, if not originating entirely from the employment of Alessi by the Republic and the nobility of Genoa, was systematised and carried out on such a scale by him as to make him justly regarded as one of the most notable architects of his time, and gave the tone to all subsequent architecture in that city of palaces, for a more intimate knowledge of which the student is recommended to the works of Peter Paul Rubens and M. P. Gauthier.

As regards Ammanati, we have selected him from a crowd of artists who would have been of the highest order in any other country than Italy, but who only occupy a secondary place in the roll of her artistic "libro d'oro," because his architectural style has always impressed us as being of special excellence, and we believe that, together with Alessi, he is not so well known as he deserves to be. Bartollomeo Ammanati was born at Florence in 1511, and received his earliest instruction in art from the two great masters, Jacopo Sansovino and Baccio Bandinelli. He appears to have worked some time under Sansovino at Venice, but returned to Florence when Michael Angelo was at the height of his fame, became an ardent admirer and follower of that great master, and shortly obtained such repute as a sculptor as to lead to his employment on important works at Rome and in other parts of Italy. About the year 1560 Ammanati would seem to have been in the service of the Medici as architect, and was employed by the Grand Duke Cosmo I. to rebuild the bridge of La Trinità, of which more anon. Vasari, who was his cotemporary (1512—1574) describes him, when engaged to complete the Pitti Palace, as "an excellent sculptor and architect;" and again, as being "among the chief of our Academicians." This was probably about the year 1568, when the second edition of his "Lives," &c., appeared. To Ammanati are due the wings and fine court at the back of the Pitti Palace, as well as the "grotto" (a kind of summer house) with the pleasant fountain above it. He would thus appear to have been regularly installed at Florence as architect and engineer, as well as sculptor, shortly after the middle of the sixteenth century, or when he was between forty and fifty years of age, and he was engaged on some very important architectural works both in Florence and Rome up to his death, which took place at Florence in 1592, in the eighty-first year of his age.

Foremost amongst them is the bridge of La Trinità, at Florence, which was commenced from Ammanati's design in 1566, and completed in 1569, and is still one of the most beautiful bridges extant. It is 323ft. long, and consists mainly of three arches of elliptic curve, the span of the central one being about 96ft., and the others 33ft. each; the curves are described from three centres, and are peculiarly elegant in effect, the graceful sweep of their lines being very marked. The width of the roadway is about 33ft., and the whole has been so solidly and well constructed, in spite of the delicate nature of the curves, that it has withstood all subsequent floods, although the height of the central keystone from the river is only 29ft. His additions to the Pitti Palace, though not free from fault, are massive, effective, and in keeping with the original design; the court-yard at the back appears to have furnished J. de Brosse with the idea of the Luxembourg Palace in Paris. By him also are the second cloister of Santo Spirito, and other minor works at Florence. At Rome he designed the large and imposing mass of the Collegio Romano, the court-yard of which is one of the best in Rome; the Sagripanti Palace; the fine Palazzo Ruspoli, a masterpiece, one of the most striking palaces in the Corso. His Palazzo Negroni is plain but good in style, and excellent in its details. The nymphœum and fountains of the Villa Papa Giulio are of great merit, exhibiting judgment and good taste in arrangement, with very good detail. He also made the original design of the ducal palace at Lucca, in a very effective palatial style, and erected the fine garden entrance of the Villa Venezze at Padua. As a sculptor his great Neptune fountain, at Florence, is too well-known to need comment; he was largely employed on works of a similar nature. As a sculptor, however, his position is well defined; but as an architect we think scant justice has been done to him, and the works we have mentioned, both for their importance and intrinsic excellence, deserve the close attention of the student.

PUBLIC ELEMENTARY SCHOOLS, OLD CASTLE-STREET, WHITECHAPEL.

IN the heart of the Whitechapel district, and in the midst of a vast supply of "the raw material" is the site of the elementary schools shown on p. 61. They are designed for the accommodation of 1,040 children—viz., two infants' schools for 200 each, two junior schools for 160 each, and girls' senior and boys' senior for 160 each. They have been very carefully arranged to meet the requirements of the School Board for London—one of the chief points being the providing of a general school-room large enough to seat the entire number of each school, while at the same time provision is made of a separate room for each class. Great consideration, too, has been bestowed on the placing of the windows, so as to provide in all cases good light and a thorough through ventilation. A large and well-lighted drawing-class room is also provided, with a committee-room for the managers. The building will be of simple Italian character, and while no money is wasted for effect, care is being taken to carry out the work in a thoroughly substantial manner. With a view to economy the site has been reduced by a quarter of an acre, which has necessitated a modification of plan, the plan we give to-day on page 61, being as submitted in competition by the architect, Mr. Edward Biven, 6, John-street, Bedford-row, W.C.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

ON Wednesday week the Council of the British Archæological Association, of whom 25 were present, entertained at dinner at the Albion, Aldersgate-street, their president, the Earl of Dartmouth. Mr. G. Godwin, F.R.S., was in the chair, supported by Mr. Planché, F.S.A. (Somerset Herald), Mr. Harrison Ainsworth, Mr. Levien, F.S.A., Mr. E. Roberts, F.S.A., Mr. R. N. Phillips, F.S.A., Mr. J. Gray, Q.C., Mr. Wright, F.S.A., Mr. Adams, F.S.A., Mr. Morgan, Mr. Goldsmid, F.S.A., Mr. Poynter, and others. The syllabus of the twenty-ninth annual meeting, to be held at Wolverhampton, from the 5th to the 10th of August inclusive, has been issued by the Council. On Tuesday, the 6th, there will be an excursion to Wall, the Etocetum of the Romans, on the skirts of Warwickshire, as well as to Haselow and Beaudesert. On Wednesday, Boscobel, White Ladies, and neighbourhood. On Thursday, Stafford and Uttoxeter will be visited; and on Friday the direction of the researches will be Bridgenorth; and on Saturday, Dudley Castle, Kinver Church, and Kinver Head. Amongst the papers is one announced by Mr. Harrison Ainsworth on "Boscobel;" one by Mr. J. Tom Burgess on "Ancient Remains in the Forest of Arden;" one by Mr. H. S. Cuming, F.S.A., on "The Mercian Saints connected with Staffordshire," and one by Mr. J. S. Phené, F.S.A., on "Serpent worship in Britain," as well as one on "The uniformity of design in the earliest British and Continental construction." The whole is under the presidency of the Earl of Dartmouth.

HOUSE DRAINS.*

THE thousand and one marvellously-constructed traps by means of which confident patentees have promised to exclude sewer gas from our houses have not yet secured their object, and will probably never succeed in defying the natural laws of fluids and gases. Mr. Osborne Reynolds, Professor of Engineering at Owen's College, Manchester, proposes to deal with the evil by abolishing all house-traps altogether, and dealing with the sewer gas *outside* the house. He places an ordinary syphon pipe between the house and the sewer, connecting the bend in the syphon—which practically forms the trap—with the open air. He has applied the principle to his own house, as shown in the annexed section. All the drains in the house are connected with the pipe H, Fig 1, which leads to a syphon trough T at the bottom of the man-hole, the latter being constructed as near the house as may be convenient. The floor of this man-hole is 2ft. above the bottom of the drain, which passes through it in the shape of an open trough T 2ft. deep and the width of the pipes, the sides being rendered in cement. This trough is so laid that the water stands half an inch above the orifice on the sewer side S, and an inch on the house side H, while to prevent scum forming on the surface, the pipe R brings rainwater from the roof and discharges it at the upper part of the trough T. Of course, in most cases a much simpler arrangement than this will suffice for the sanitary requirements of the house, for a syphon trap, Fig. 2, with a pipe communicating with the surface and connected with the rainwater pipe, will be found to prevent all influx of gas into the house. In this way a trap is formed which effectually closes both the house and the sewer from the man-hole, and *doubly closes* the house from the sewer; and if care is taken to arrange the orifices of the pipes in the man-hole as recommended, it will not be possible for the water to be sucked out of the trap even should the pipe run full.

FIG. 1

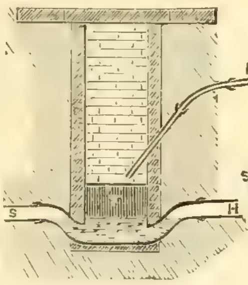
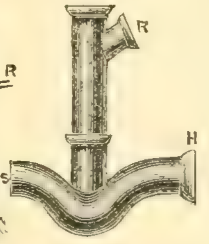


FIG. 2



ALL SAINTS' CHURCH, HORDLE, HANTS.

THIS church (see illustration) is built on the site of a modern building of 30 years since, which was erected two miles further inland to replace a church of the twelfth century then pulled down in consequence of the encroachments of the sea. Being in bad repair and of poor construction, this modern church has given place to the present, for which funds have been chiefly provided by J. P. Kennard, Esq., of Hordle Cliff, a parishioner. The whole cost, when the tower (now building) is completed, will be about £6,000.

The work is of red brick, with dark pointing externally and internally, and the roofs are covered with Welsh slate and red tile crestings; the dressings are of Bath stone. The chancel measures 30ft. by 20ft. on plan, and is floored with Maw's tiles, and seated with oak stalls with seats for boys. The altar is raised seven steps above nave floor, and is of oak, carved, with a reredos by Mr. Forsyth, of five arched panels, the centre containing our Lord sculptured sitting with the book of the Gospel and orb; the side panels are filled with the Evangelistic symbols in Venetian Mosaic. There are also carved piscina and credence with sedilia. A metal screen, by Messrs. Richardson, Slade, & Co., of Brownlow-street, closes the chancel from nave. The roof is open-timbered, with trefoiled arches and traceried cornice, and is of pitch pine. The east window, of three lights under one arch, is filled with painted glass by Heaton, Butler, & Bayne, with Crucifixion in centre, and the Resurrection and Christ appearing to Mary in the side lights. On the south side there is a single light, by the same artists, who have been commissioned to execute the two other windows of the chancel for — Heywood, Esq.

The nave, 63ft. by 22ft. 6in., is seated with open benches of pitch pine, and has a roof of yellow fir of simple cradle form. The glass is by Messrs. Adams & Cocking, in patterns of two tints. On the north side there is a memorial window of members of the family of Lieut.-Col. Raitt, by Heaton, Butler, & Bayne. The vestries and organ chamber, with vault for Moule's heating apparatus, are on the north side of the church. Mr. Jos. Lauder, of Burton, near Christchurch, is the builder.

LONDON MARKETS.

THE Corporation of London is proposing to spend upwards of £300,000 in increasing the market accommodation at Billingsgate and Smithfield. At the last meeting of the Court of Common Council, the Coal, Corn, and Finance Committee reported on a reference of the 15th June, and recommended that the sum of £150,000 for the enlargement of Billingsgate Market be raised on bonds, to be secured on the credit of the tolls, &c., to be received by the Corporation under the Billingsgate Market Acts, and of their estates and revenues, in pursuance of the provisions of the 21st section of the Billingsgate Market Act. The same committee also brought up a report on a reference of the 22nd February last, and recommended that the estimated sum of £167,500 for the purchase of ground and erecting the additional meat and poultry market in Smithfield be raised on bonds on the credit of the rents of the present market, subject to existing charges, and of the proposed additional market, and also of the estates and revenues of the Corporation. The report with reference to Billingsgate Market was ordered to be printed and circulated, and the report as to Smithfield Market was agreed to.

BROOKFIELD NATIONAL SCHOOLS, HIGHGATE RISE.

THIS group of school-buildings, which we illustrate this week, has been recently erected upon a site given by the Baroness Burdett Coutts, just below the Highgate Cemetery, from the designs, and under the superintendence, of Mr. J. P. Seddon, architect. The accommodation provided is for 300 children—namely, 120 infants, 90 boys, and 90 girls, with three residences for their respective master and mistresses. The cost was about £3,000, and £500 for fencing, laying out grounds, architect's commission, &c. The site being upon stiff clay, unusual care had to be taken with regard to foundations, and deep and wide trenches were filled with Portland cement concrete. One requirement of the committee was that the floors should be such as to obviate noise as much as possible, and in consequence no space was left under the floor boards, but the ground filled in and covered with a thickness of Portland cement concrete and flushed up with cement, light joists being embedded in the same. The external walls are all built hollow, with bonders between the two facings of Staffordshire non-porous black bricks. The facing is of ordinary stock brickwork, with bands and window dressings of red. The roof covering is Broseley tile, with ornamental crests from the architect's design, made by the Farnley Iron Company, Leeds. All the school and class-rooms have boarded ceilings, with intersecting ribs and moulded cornices, which give a very pleasant and finished appearance, and provide a space above for the regulation of ventilation, far preferable to what can be obtained with roofs open to the ridge. These rooms are all warmed by ventilating and evaporating Gill stoves, specially arranged for the architect by Mr. John Barber, engineer, of Leeds, and these have been found exceedingly efficient and economical as regards consumption of fuel. The bell turret has the exposed framing of oak, and is covered with oak shingles. The position of the buildings, though pleasant and open, and well situated as regards the increasing population of that locality, at present hardly does justice to this picturesque and effective pile of buildings, in consequence of the ground in front rising from it, but a new road is projected, which will, probably, to a considerable extent obviate this. Mr. Wigmore, of Walham-green, Fulham, was the builder employed to carry out this work, and he has done so satisfactorily.

We may add that these schools have received the particular approval of the National Society, who gave a grant of £300. The Society has had the plans copied as models for other localities.

The *Portsmouth News* states that a gentleman has volunteered a gift of £1,000 to be applied to such improvements of the interior of Romsey Abbey as may be recommended by an architect of eminence and approved by the parishioners.

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* Sewer Gas, and How to Keep it Out of Houses. By OSBORNE REYNOLDS, M.A. London: Macmillan.

ADVANTAGES OF STEAM ROLLING FOR THE REPAIR OF ROADS.

THE following is the report of the chief surveyor to the Board for the Borough of Hackney on steam rolling:—

Surveyor's Office, Town Hall, Hackney.

Gentlemen,—I beg respectfully to report that, on inquiry in relation to, and after survey made, of the several roads that have been repaired by aid of the steam roller, I find that the Vestry of S. Mary, Islington, has repaired considerable lengths of highway, and amongst others the following roads will give a fair illustration of the advantages arising from its use, viz:—

Upper-street.—From the Angel Tavern to Highbury Station.

Highbury New Park.

Holloway-road. — Highbury station to Seven Sisters'-road.

Park-street.—Upper-street to College-street.

Canonbury-lane, Square, and Place.

The process of repair, as compared with the old system, involves the lifting of the top surface of the road, so as first to put the road into form. It is then covered with broken granite, averaging in the cases named from $1\frac{1}{4}$in. up to 6in. in depth. After one or two turns of the steam roller, the material is covered with fine gravel or granite siftings; the road is then watered, and the sand swept in. The water cart thereafter continues to precede the roller, until the mass of material is sufficiently consolidated.

The results of this mode of repairing roads are—First: their immediate fitness for use, presenting a uniform and firm foothold for horses, and a smooth surface for vehicular traffic. The difference in driving over a road thus repaired, as compared with the old system, can be both seen and felt.

The general condition of the road surface thus repaired, when it begins to wear, exhibits a close series of small hollow places on the portions subjected to the greatest wear from the traffic stream; whereas, the surface of roads repaired in the ordinary way, presents large hollow places which occur at very irregular distances. It is, however, possible for a road repaired by means of the roller to wear in like manner, by a careless formation of the road, or spreading of the materials, or both.

The second important result, as arising from the use of the steam roller, is that of the economy of the materials used in the repair, and also the labour expended on the road.

Under the ordinary system, the granite is left loose on the road surface until pressed and bound down by the traffic; but long before the materials get fixed in place, the angles are rounded off, and a considerable portion of the stone is ground away. The vehicles also displace the loose material and form ruts in the chief line of traffic, so that it becomes exceedingly difficult to keep the road in proper form, and the road quickly becomes as defective as before.

In proof of the condition of the stone after it has been worked down by the traffic in the manner just previously described, I may just state that the North Metropolitan Tramways Company is now engaged in laying down tramways in three of the above roads—viz., Upper-street, Holloway, and Seven Sisters-roads. In excavating for the purpose of constructing the trams and laying the new stone pitching, the section of the road crust is exposed on each side, and I obtained from the under or lower section (which formed the road before the repairs were carried out by the aid of the steam roller) several sample stones, which are numbered as follows:—

Samples No. 2 were taken from Upper-street, opposite Islington-green.

Samples No. 4, from Holloway, near the Chapel of Ease.

Samples No. 6, from Seven Sisters-road, near Hornsey-road.

An examination of these samples will show, in some cases one, others two or even three distinct worn traffic faces, showing that the stones were several times shifted from their bed before being finally fixed. The samples numbered 6 were surface stones, carefully removed from the top edge of the road crust that had been repaired in the ordinary way, and as left by the excavation for the trams. Their condition proves the rough and violent action to which they had been subjected before settling down in their places. At the same time I also obtained surface stones that had been fixed in their respective positions by the action of the steam roller. The portions rubbed and abraded by the traffic can easily be detected; all the other parts of each stone have their angles and rough faces preserved intact, and had left their exact impress in the beds from which they were taken.

Samples No. 1, are from Upper-street, Islington, and have been subjected to the rolling traffic for about 10 months.

Samples No. 3, from Holloway, laid down 11 months ago.

Samples No. 5, from Seven Sisters-road, laid down about 12 months since.

I am informed by the Surveyor of Highways, that certain narrow parts of the rolled road, which formerly required three dressings of new material in a given time, now require but one only.

From observations carefully taken by the Surveyors, it appears that, in $64\frac{1}{2}$ days and 23 nights, the steam roller finished 671,216 superficial yards of roadway, at an outlay of £493 18s. 10d. (about $1\frac{3}{4}$d. per yard), while the cost of materials and other labour for which this expenditure was incurred amounted in the aggregate to £4,802 4s. 2d., or 1s. 5d. per yard.

In working out the cost for each road, I find that the cost per yard super varies from 1s. $1\frac{1}{2}$d. to 1s. $10\frac{1}{2}$d., and for rolling from 1·57 farthing — say $1\frac{1}{2}$ farthing—to $2\frac{1}{2}$d. ·37. It would seem that the roller can be worked at less cost per yard on the wider roads, although both in wide and narrow roads the cost will increase in proportion to the thickness of new materials used.

The cost per day, on hire, has varied, for the parish of Islington, from £3 10s. 10d. to £4 10s. 6d., including all working expenses, water carts, water, watching, fuel, &c. It is now their own property, and is worked for about £1 12s. per day, exclusive of watching and water; or about £2 10s. per day, as against £4 10s. 6d.

An examination of these sample stones will give a convincing proof of a considerable saving being effected, besides the advantage of comfort for both horse and man on the roads.

At S. George's, Hanover-square, the expenses of working the roller are stated at £1 11s. 8d. per day, and the Surveyor further states that that sum provides for water carts, two men, and fuel, and that he finds the roller invaluable, as it will immediately consolidate 11,000 yards superficial of new-coated granite roads per day. He further states his firm belief that economy in road maintenance will be effected by its use, and that public opinion would prevent its discontinuance.*

The Board of Works for the Poplar District has had Aveling & Porter's steam roller on hire, and the Surveyor has kindly furnished me with the particulars of the cost of each road rolled during a period of 88 days.

On computation, I find the aggregate gives in the first list 15,146 yards super rolled in 17 days, at an outlay of £46 19s. 1d., or 2·98 farthings—say 3 farthings per yard—£2 3s. 6d. per day, while the repairs cost £716 19s. 4d., equal to $11\frac{1}{4}$d. per yard.

The second list gives 45,699 yards during 71 days, at an outlay of £2,747 11s. 2d. for repairs, or half $\frac{1}{4}$·61 per yard, and £183 10s. 1d.—3·98—say 1d. per yard super = £2 11s. $6\frac{1}{2}$d. per day.

The process of working, however, differs in some of the roads in Poplar from that of Islington. In lieu of the covering of sand, washed in by the water-cart, a thin layer of road sweepings is spread over the road, and the new granite laid thereon. The extreme weight of the roller presses the stone into the soft bed; and, if found necessary, a little water is added, and the softening is then worked up to near the surface of the road in the process of rolling.

Of course, this is much cheaper as a first outlay, but having inspected both the Islington and Poplar roads, it is suggested that the soft bed may continue for some time to exude through the joints of the stones under the traffic, and keep the road, in damp weather, in a dirty state. This may occur even with an appearance of soundness, and if this theory be correct, this system will tend to weaken the road; but, on the other hand, the stones may, by the rising of the soft bed, be brought into closer contact, because of the fineness of the particles. It could be easily tested, by repairing in the two modes, a length under each system, in one line of thoroughfare. The saving is considerable, if effective, and is, therefore, worth the experiment.

New rollers are required about twice in a year, and other parts of the apparatus require renewal in from five to seven years, and its first cost is £550. Considering that the roller is capable of rolling on the average 700 or 800 yards per day, and that its work is at present limited to broken granite and flint roads, and also bear in mind that next year the introduction of tramways may further render unnecessary its use over a considerable portion of the most important thoroughfares of this district, I am of opinion that it is more desirable, at starting, to hire than to purchase. I believe that some, if not all of the manufacturers of steam rollers would be willing to let at a sum per day, as may be required, and subject to certain limitations as to time, to allow the option of purchase, and the sum paid for hire taken as part purchase.

The horse roller at work in this district costs £1 4s. per day, and as a question of comparison between the horse and steam roller I am of opinion that a steam roller will do more good in three turns over the road, than the horse roller will do in twelve.

I am, Gentlemen,
Your Obedient Servant,
(Signed) James Lovegrove, Chief Surveyor.

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COMPETITIONS.

Blackpool New Market.—Plans from upwards of forty architects have been received, in answer to the advertisement of the Local Board of Health, offering premiums of £30, £20, and £10, for the three best sets of plans for a new market to be built on the land at present occupied by S. John's Market and the shambles.

Hull.—At a meeting of the Hull School Board, on Wednesday week, the chairman moved "That the resolution of the Board of the 22nd of May last, adopting the report of the united committees on the selection of plans, be, and the same is hereby rescinded, and that the premiums of £50 and £25 offered by the Board be equally divided in the purchasing of three of the sets of plans." He stated that the plans in question were those marked "Argus," "Well Considered," and "Sector." The motion was carried.

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THE SCHOOL BOARDS.

Bradford.—On Friday last, the Bradford School Board adopted the following builders' tenders for schools:—Feversham-street, £14,350; Ryan-street, £14,529; Bowling Back Lane, £10,514; and Horton Bank Top, £4,828. These tenders were all considerably in advance of the architect's estimates, and this was attributed to the continual advance in the price of building materials and wages. Objection was made, and discussion arose. It was contended that the Board had no alternative but to proceed at once with the buildings. There was no probability, it was said, of the cost of building being less; but, on the contrary, there was great likelihood of further advance.

London.—On Wednesday, at the weekly meeting or this Board, on the motion of Mr. Reed, reports from the Works Committee were approved of, in which were embodied various recommendations respecting the acquisition of sites in Notting-hill, Edgware-road, Hackney, Camden Town, and Southwark. Mr. Reed also gave notice that he will move at the next meeting that Mr. Robson be appointed architect to the Board, at a salary of £1,000 a year, with a view, amongst his other duties, to designing the schools of the Board; that Mr. Robson give his time to the Board, and that the Board provide the necessary staff and officers. Also that he will on the same day move that a separate officer be appointed, whose duty it shall be to assist the Works Committee in the acquisition of sites.

Rochester.—The plans accepted by this Board for the Troy Town new school have been returned to the Board by the Education Department with expressions of approval. Mr. Walker, of London, is the author of these plans.

Wolverhampton.—At the meeting of the Wolverhampton School Board, held last week, it was resolved to accept the tender of Mr. Clarke, for the erection of the new schools and an outer wall, and also for the supply of the fittings, for £3,019.

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Lake's Dining Rooms, 29, Great Tower-street, are being rebuilt. A bar and counter, with large dining-room, is to be built and ample provision is being made for efficient ventilation. The front elevation to the second floor is to be of Portland stone, while the upper portion of the front is to be faced with white bricks with stone dressings. Private chop rooms, smoking apartments, &c., are to be provided on the ground floor. The principal fittings will be of Honduras mahogany. Messrs. Heywood & Blashill, of Old Jewry Chambers, are the architects, Mr. McLachlan, of S. James's-street and Clapham, the builder, Mr. Raby having the supervision of the work.

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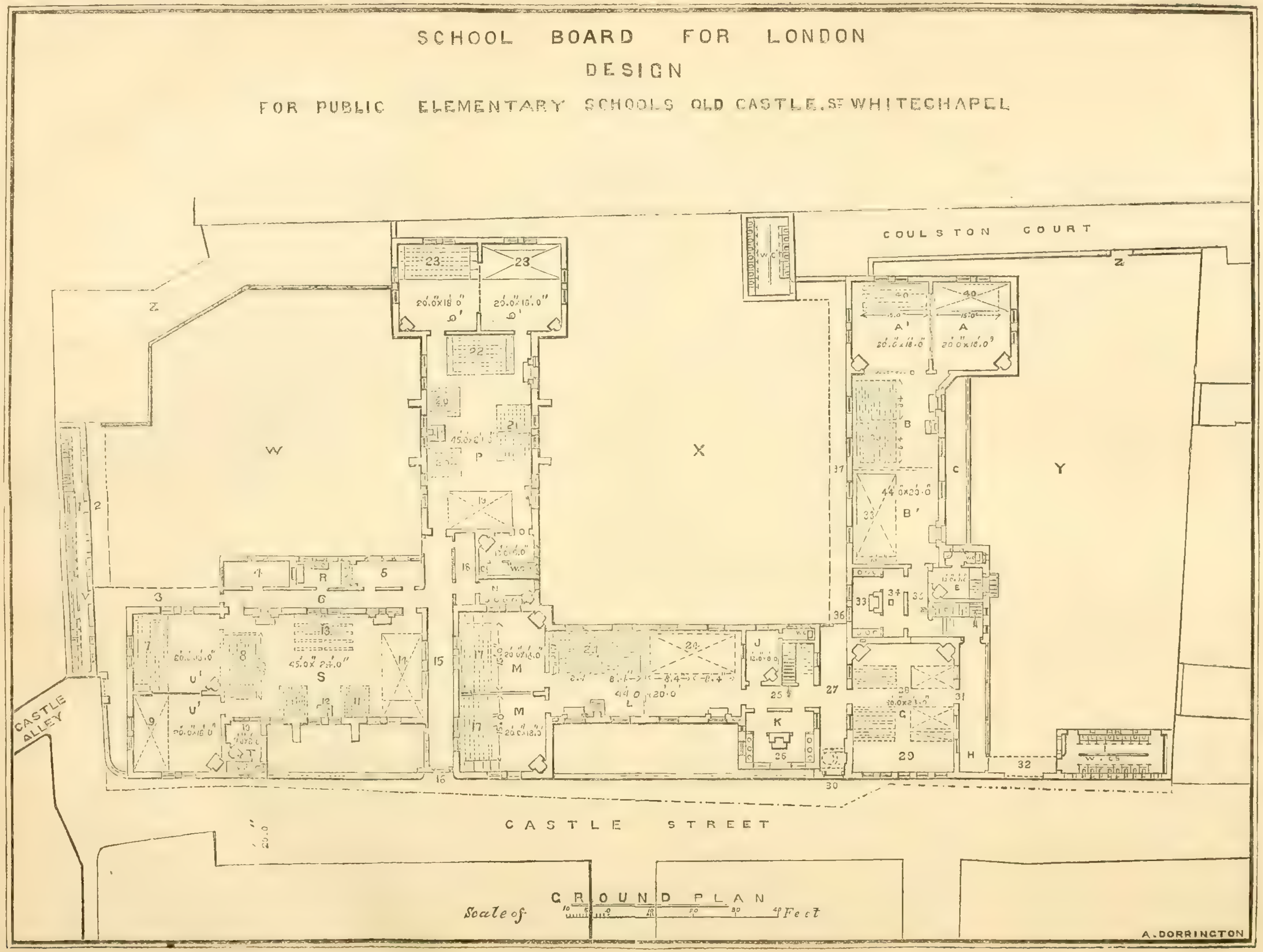
* Since this report was written, Mr. Tomkins, the Surveyor, in reply to a question, says:—"We use the grit from the flint roads with better results than hoggin; it costs only the cartage, and goes further than hoggin at 5s. 6d. per day."



SCHOOL BOARD FOR LONDON
DESIGN
FOR PUBLIC ELEMENTARY SCHOOLS OLD CASTLE, St WHITECHAPEL

GROUND PLAN

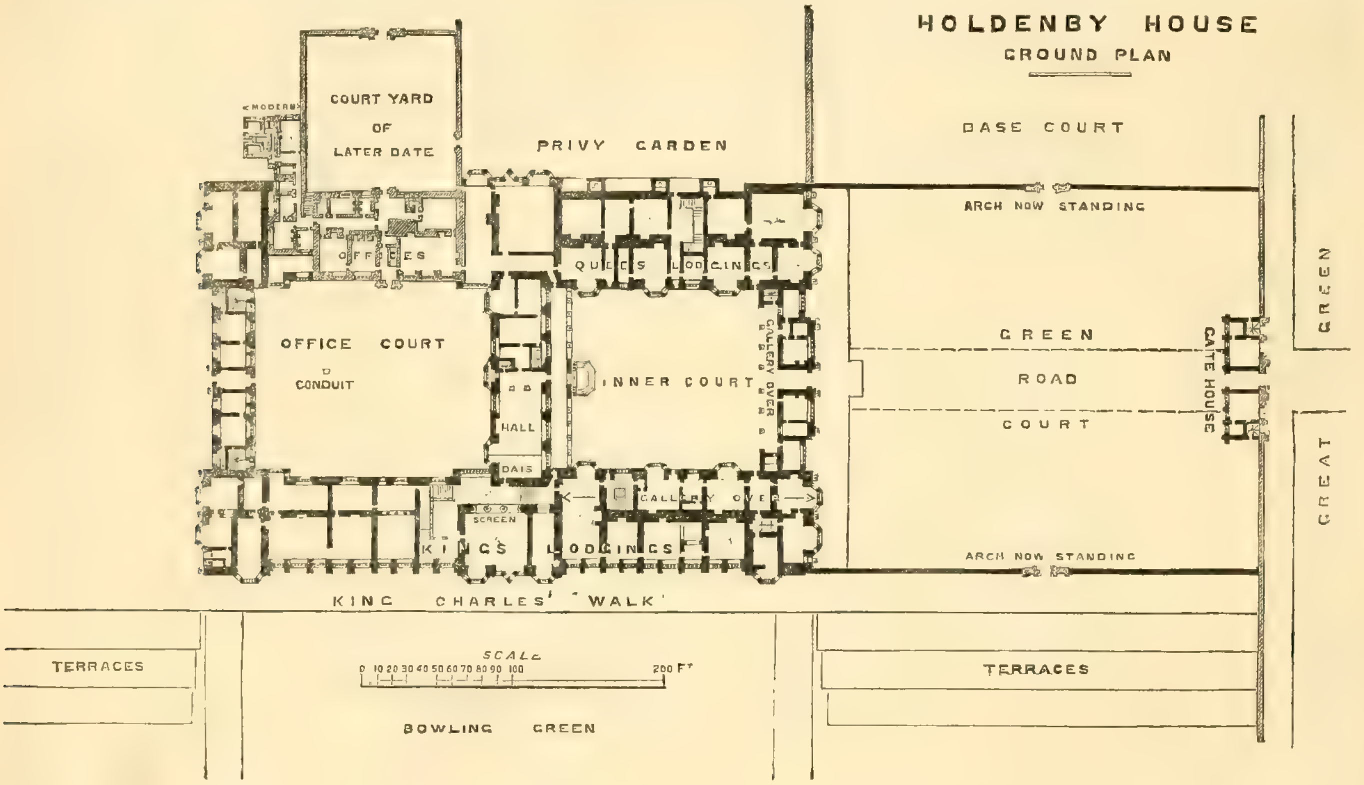
REFERENCES TO PLAN.

(For description see page 59.)

A A. Class Rooms.
B B. General School Room, Boys (Junior).
C. Open Area.
D. Lavatory, Hats and Cloaks (Boys).
E. Master's Private Room.
F. Staircase to Senior Boys' School.
G. Managers' Room (Committee).
H. Glass Roofed Covered Way.
J. Mistress' Private Room.
K. Lavatory, &c. (Girls).
L. Junior Girls' General School Room.
M M. Class Rooms.
N. Lavatory.
O. Mistress' Private Room.
P. Infants' General School Room (No. 2).
Q Q. Class Rooms.
R. Lavatory.
S. Infants' General School (No. 1).
T. Mistress' Private Room.
V V. Galleries for 40 Infants each.
W. Infants' Play-ground.
X. Girls' Play-ground.
Y. Infants' Water-closet, &c.
Z. Play-shed (if required).
1. Infants' Water-closet.
2, 3, 6, 15, 27, 32, 36, 37 Covered Way.
4. Coals.
5, 18. Hats, Cloaks, &c.
7, 8, 9, 10, 14, 19, 22, 23. Galleries for Infants.
11, 20, 21. Movable Desks for Infants.
12. Mistress' Desk.
13. Movable Benches for Infants.
16. Infants' Entrance.
17. Gallery for Girls.
24. Desks for Girls.
25. Passage.
26. Lavatory.
28. Drawing Class Room.
29. Space for Casts, &c.
30. Girls' Entrance.
31. Boys' Entrance.
32. Lavatory for Boys.
35. Passage.
38. Desks, &c., for Boys.
39. Desks for Junior Boys.
40. Galleries for Boys.

HOLDENBY HOUSE.

We give this week, as promised a fortnight since, the plan of Holdenby House. We were unable to give it last week, the index having consumed so much space. Holdenby House was built for Sir Christopher Hatton, Lord Chancellor of England, in the reign of Queen Elizabeth, by John Thorpe, one of the most celebrated architects of his day, the builder of most of the other great English houses of that period. Later still, further works were carried out (it is said by Inigo Jones). On the north side of the offices a court was formed, with a gateway towards the north, and additional offices on the west. The annexed plan is a reduction of the original now preserved in the Soane Museum. From documentary evidence taken from the State papers, it appears that Holdenby House was purchased by James I. in 1609, from Sir Christopher Hatton, Kt., for his son Charles, afterwards the unfortunate Charles I. This sovereign made it a constant place of residence, and it was here that he was confined by the Roundheads after his surrender at Newark.



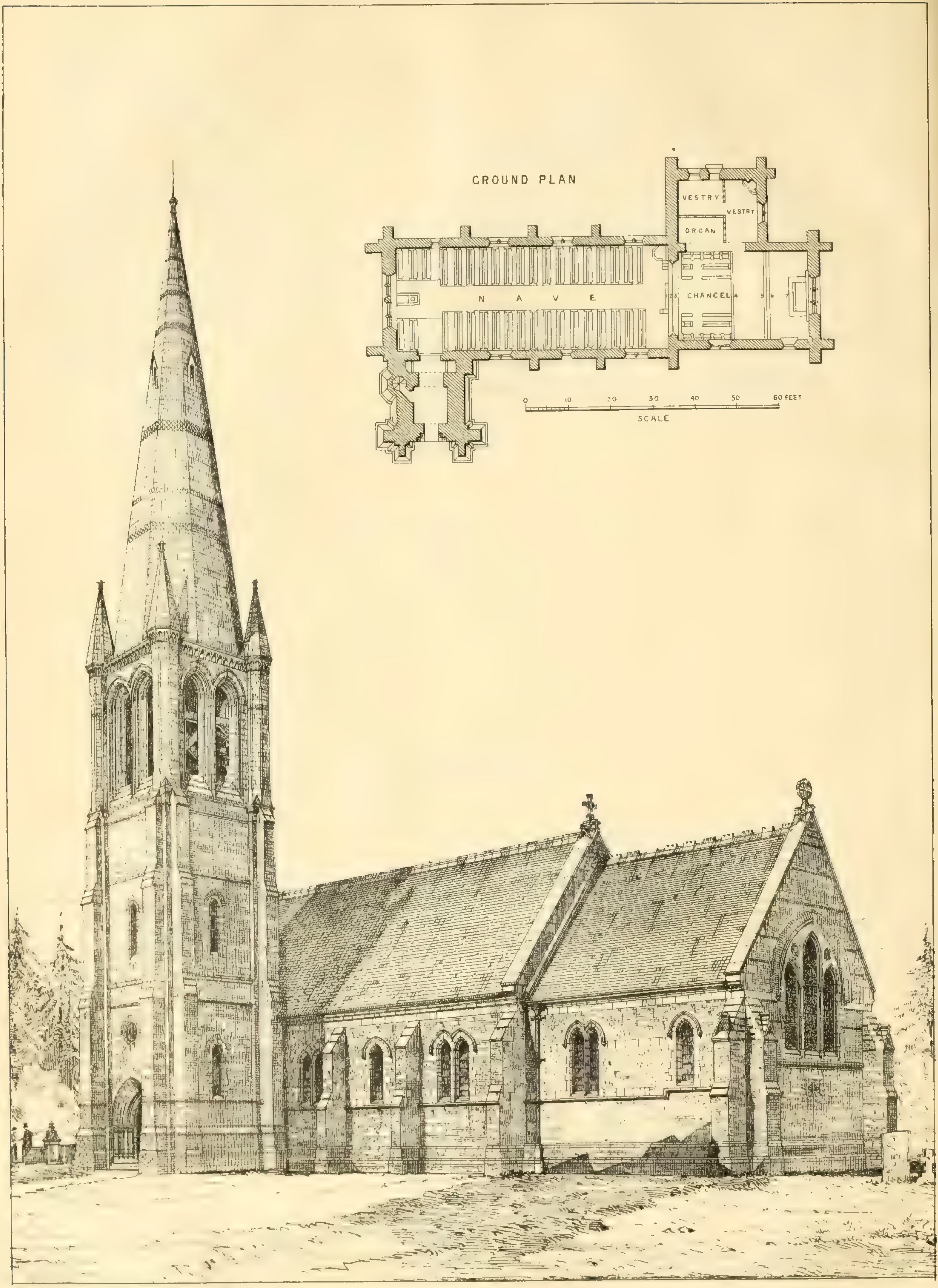
After the death of King Charles, Thomas, Lord Grey, one of the leading Parliamentarians, received from his brethren a grant of the House and Manor of Holdenby; by him it was sold to one Baynes, a Yorkshireman, who pulled down the whole of this grand mansion, reserving only a portion of the north wing, probably for his own habitation. After the Restoration Holdenby lapsed to the Duke of York; by him it was sold to the Earl of Feversham. It next passed by purchase to the Duke of Marlborough, and from this family by sale to Viscount Clifden.

The palace was built in the form of two quadrangles; entering from the east through the Great Green and passing through the double gatehouse you entered the Green Court, in the centre of which was a broad roadway leading up to the grand entrance; this court was bounded on each side by a wall, with a fine arched gateway in the centre (these gateways still remain in a perfect state), that on the north opening into the Base Court and that on the south on to King Charles' Walk and the terraces. Some idea of the house itself may be gathered from the Surveyor General's report made in 1650; it is spoken of as a noble mansion built of freestone; the inner court being paved "and incompassed by a fair gallery on the east, on the south with the stately lodgings commonly called the King's Lodgings, on the north with the lodgings called the Queen's Lodgings, on the west with the hall and kitchens; there being likewise at every corner of the said inward square four magnificent towers, and in the said house many costly and rare chimneypieces, many other spacious chambers and withdrawing rooms to them belonging, it being a house of very great receipt also. Upon the south-east of the aforesaid mansion house is a goodly fabric built of hewn stone, commonly called the Dairy House, consisting of many fair large rooms; on the north-east is a spacious stable, well built of stone, containing over it many fair lodging chambers with chimneys in them, a great part of which have cellars under them. On the east end of the said stable, the brewhouse with all utensils thereunto belonging." These last named buildings do not now exist. Besides this account there is an interesting letter of Lord Burghley to Sir Christopher Hatton, on the occasion of his lordship's visit to Holdenby. Hatton himself was unable to receive his noble guest in person, being unavoidably detained at Court. Lord Burghley says: "But approaching to the house, being led by a large, long, straight, fair way, I found a great magnificence in the front or front pieces of the house, and so every part answerable to other to allure liking. I found no thing of greater grace than your stately ascent from your hall to your great chamber, and your chambers answerable with largeness and lightsomeness that truly a Momus could find no fault. I visited all your rooms high and low, and only the contentation of mine eyes made me forget the infirmity of my legs." From existing remains and old drawings of the ruins, but above all from the still standing works of Thorpe, such as Binghley, Kirby, and Audley End, all of which it exceeded in magnificence, we may see that Lord Burghley's praise was well deserved. The principal fronts were three stories high; the south front was perfectly symmetrical; the projecting bay windows of the chapel and stairs formed a centre on each side of which was a row of eight windows, mullioned and transomed, with pilasters between them, and rich cornices between each story surmounted by a balustered parapet. The hall was placed centrally between the quadrangles. With the exception of the hall the buildings were double, with the chimneypieces invariably in the central wall; most of the rooms opened into one another.

For some time the remains of the palace had been used as a farmhouse, when in 1869 the trustees of the late Lord Clifden determined to restore it in part as a residence for Lady Clifden. With this object Messrs. Slater & Carpenter, the architects, examined the existing buildings and the site, and submitted designs for the partial restoration of the fabric. The house was found to be much modernised; instead of the double roof a single roof of lower pitch had been substituted, a portion of the front wall had been rebuilt with ugly square-headed windows inserted; also many outbuildings had been added, which, however useful they might be for farm purposes, were entirely out of character and out of place. The restored portion has been made as nearly like the original as modern requirements permit. On the ground floor three large windows have been inserted in the south wall of the great drawing-room, in the place of the two smaller ones shown in Thorpe's original plan. The great chimney-stacks, excepting those on the gables, are in a perfect state of preservation, and have not been touched in any way.

As this portion of the mansion had been the office block, naturally the mouldings were of plain detail; the original full-size drawings of these are now preserved in the Soane Museum.

The porch or frontispiece shown on the drawing, and which resembles that at Kirby, was not in Thorpe's original design, but is an addition, the old door which stood in the same place having disappeared. It is at present out of the question to think of rebuilding the entire mansion, as the cost would be very great. It is estimated that to lay out the grounds in their original grandeur would cost about £1,000,000; put so that there may be no difficulty at a future time of extensions to the present mansion, the new office wing has been built on the old foundations. And it has been further suggested by the architects, for the sake of preserving the lines of the ancient mansion, that the gardens be laid out on the site of the quadrangles, preserving their shape. The terraces, bowling green, and platforms still remain in a perfect state.



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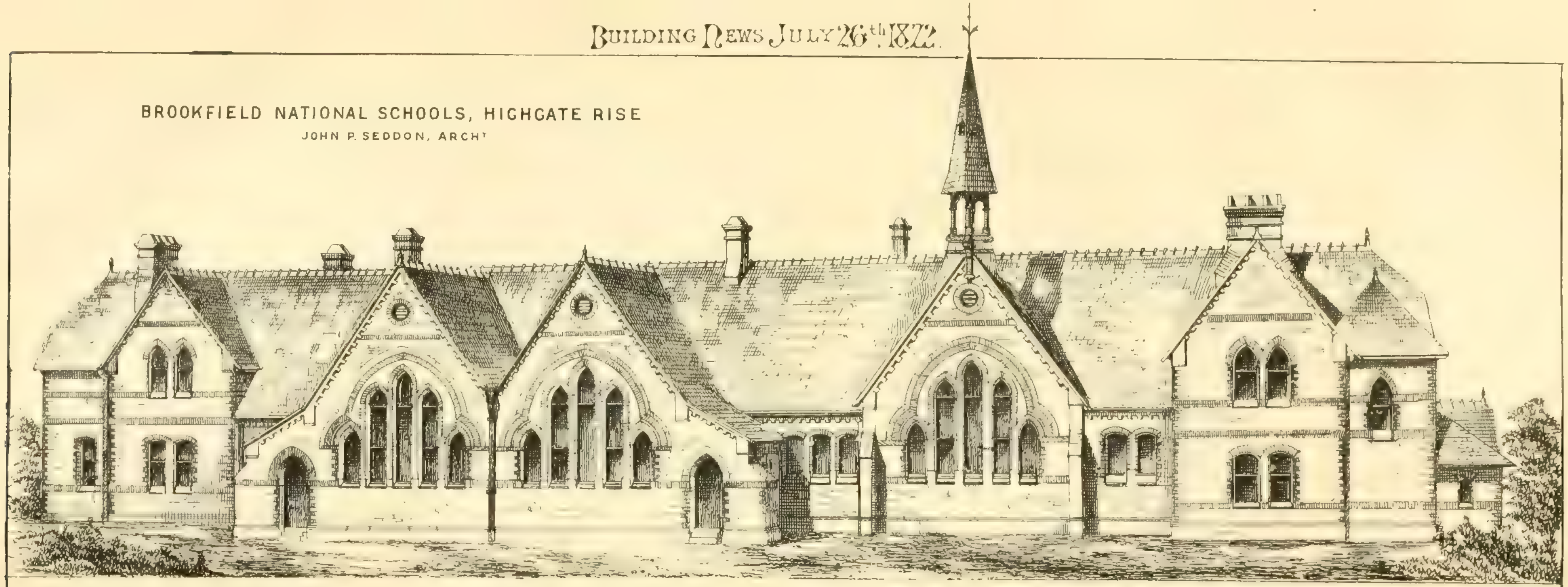
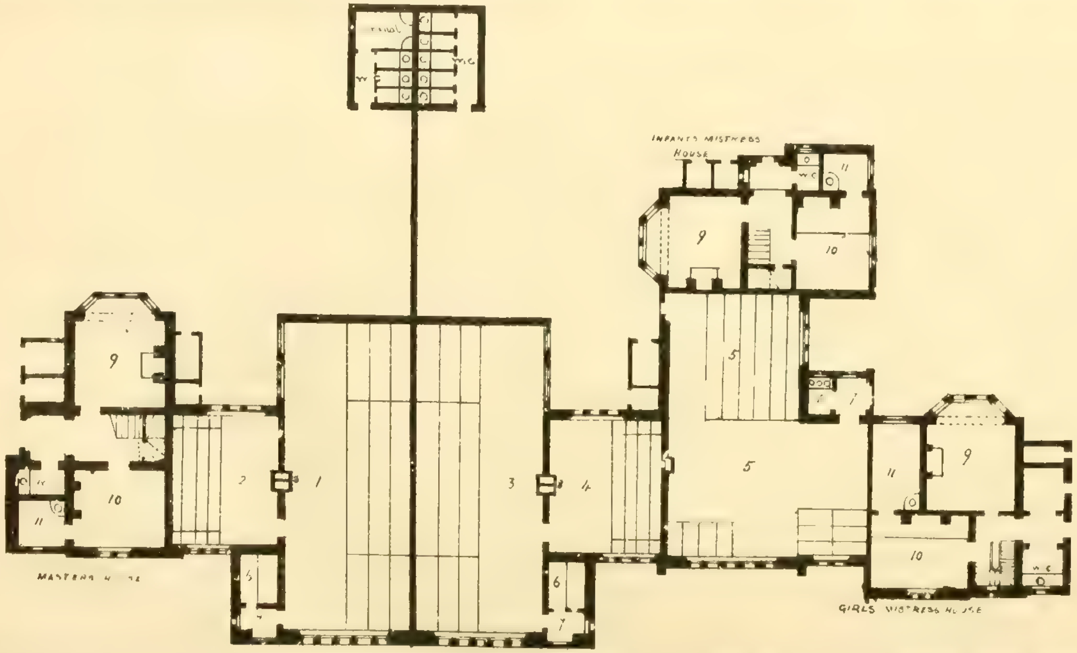
PARISH CHURCH, HORDLE, HANTS.

GILES & GANE, ARCHTS.

BROOKFIELD NATIONAL SCHOOLS, HIGHGATE RISE

JOHN P. SEDDON, ARCHT





References

1 Boys School Room.	ft 42 x ft 17	=	ft sup 714
2 " Class Room	18 x 15	=	270
3 Girls School Room	42 x 17	=	714
4 " Class Room.	18 x 15		270
5 Infants School Room			520
6.6.6 Lavatorys			
7.7.7 Porches			
8.8 Evaporating Gill Stoves			
9.9.9. Parlors	14.6 x 12.0		
10.10.10. Kitchens	12.0 x 10.0		
11.11.11 Scullories	10.6 x 7.0		

Acommodation

Infants	120
Boys	100
Girls	80
Total	300

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MODERN ARCHITECTS AND THEIR WORKS.—III.

MODERN Palladianism and the Elizabethan-style-revived occupy in point of date the first and second places in our list of modern styles. The third place must be assigned to what for the sake of distinction may be called *Academy-Gothic*, and by this phrase I do not mean to implicate in any way our own Academy at Burlington House. What I wish to convey by the use of the word is that kind of Gothic which comes from a cold formal obedience to a circumscribed and set rule of precedent; an obedience that at its best is just as unlikely to produce a living style of Gothic as it is for the most careful regard of the minutest fraction of a module to result in perfect Greek; a style having no more of real Gothic art in it than the church in Euston-square has of Greek art. Careful measurement of old examples is all the study required for such work. An engineer or surveyor, or, indeed, a builder's clerk, can belong to this class of architects at a moment's notice. Possessing Bowman and Crowther's "Churches," and a few other kindred works, he may even dispense with personal measurements altogether. For just as Stuart and Revett's plates formed the only stock-in-trade of most "Classic" architects, so in the case of many a Goth, the early-measured drawings of our old churches, colleges, &c., have served precisely the same useful end. I know, for example, one new church for which the drawings required were merely enlargements from Brandon's "Analysis," and I use the words in their literal sense, for I happened to see the clerks making the enlarged drawings. The architect himself who directed this easy manufacture is now dead, and I should do no good by mentioning his name. I only cite the case, because there is every reason to believe that it is by no means a solitary one, and that a very large proportion of modern Gothic buildings, especially those devoted to religious observances, are evolved in a manner that it would be unjust to dignify by the words *modern design*. There is, indeed, no design in them, except such little as may remain in the likeness of old work after the flavourless *réchauffé* is made in which this class of modern architects employ their talents. The only argument I have ever heard seriously advanced in support of this kind of modern architecture is that it is better to copy good things than to design bad ones. I am not altogether sure that it is not better to attempt to walk alone, even though stumbles be inevitable, than to rely for ever on leading-strings. But for the present let us admit the argument in favour of copying to be sound; does it not in plain terms imply a high degree of critical knowledge? What are the good things, and how do you know them to be good? Is it merely after all a question of individual "taste"? or is there really such a thing as a right proportioning of solid to void, lateral and vertical, beyond the limits of which the best of us must come to grief? And by the right proportion of solid to void, I mean much more than is involved in mere consideration of wall space. The bars of a sash, the tracery of a window, the projecting and receding mouldings of arch or architrave, base or abacus, are all questions of solids and voids, and even the distance between intrados and extrados of a perfectly plain arch in a perfectly plain wall may come within the meaning of the phrase. If, then, there be such a thing as fitting proportion, surely the sensual and mental condition of an architect able to receive it, measure it, and judge it must be acute, critical, and strong, and being such, is it too much to suppose that the original designs of such a man would be subjected to the same critical sense of proportion and fitness which he is asked to exercise in his selection of models to copy? The truth is we are not critical. We are overgrown with antiquarian rust. We admit, according to our party prejudices, all Mediæval or all Classic Renaissance work as above the reach of question, and beyond the touch of analysis. We are the slaves of those who will employ us and not their leaders. In the witness-box there are of our most prominent men those who find it easy to forget the dignity of their profession, nay more, all that their art teaches them, for the low profit of partizanship. We have grown too rich and too mighty for the service which art so rigidly demands from all who profess to follow her. We are advocates, not artists, and the bent of our minds is to do anything rather than devote ourselves to architectural study. Thus it comes that we shirk all critical inquiry, and adopt the easiest method of producing what we have the impertinence to call "designs," by following a system of wholesale copyism, and then inventing fallacious arguments to show that it is the very best course to pursue.

Now, who are those who have thus taken the name of architect in vain? Who are those who, if we had the simplest elementary examination in design to-morrow, would incontinently fail? Their name is legion. Of all men they do the greatest harm to modern Gothic art, because the shallow multitude take their poor copies for original designs, and are utterly incapable of seeing the difference. To name them would be wasting time. To single out leaders is impossible, because they have none. How far the apostles of the Revival are to blame is not now the question. It may be that the character of the criticisms in the *Ecclesiologist*, and the long reign of precedent, when an unfortunate architect was nearly always scarified by one or more of a coterie of sharp writers unless he could show Mediæval chapter and verse for everything in his design, have been the cause of much of the evil we now deplore. But there are, I need scarcely say, degrees of copyism. There is the "copy" which is nothing but a ridiculous travestie of the original, and there is the copy which may even deceive one of the critical few. This last is amusing and clever, and shows that its author is at least learned as an antiquary, and may be capable of better things. The first is altogether contemptible, and not unfrequently leads to the final disgrace of travestying the designs of contemporaries which, in their turn, may have been more or less copied from old work. Such is the class of design which Mr. Kerr has taken the trouble to put before his readers at p. 367 of "The English Gentleman's House" (third edition). To say that it is a parody or burlesque of Gothic would be untrue; it has not the cleverness of the one nor the fun of the other. It is, without the faintest exaggeration, nothing but a coarse *rechauffé* of scraps of Gothic, picked up, as it seems, by accident; and yet Mr. Kerr has the consummate assurance to say (A.D. 1871) that it shows modern Gothic "at its best." I venture to say, without any qualification whatever, that it shows it at its worst. It is no doubt the *sort* of Gothic, the contemptible *kind* of Pointed art, which such architects as Mr. Kerr, Mr. Donaldson, and Mr. Wyatt would like to encourage, for the grossest error of the feeblest Palladianism is better than such Gothic as this, and the wildest ugliness of the rococo works of the age of Louis Quatorze deserves less censure. Mr. Kerr professes to be serious, so here we can estimate with tolerable accuracy his artistic qualifications. How admirably fitted he is for an examiner of candidates for the Institute certificate, and how well entitled he is to be listened to, will be manifest to any architect of fair abilities who will take the trouble to refer to that part of his work which treats of modern Gothic. Criticism that in its ignorance *can* not, or in its injustice *will* not, distinguish between the works of the most accomplished architects and those of the miserable ruck of copying clerks who set up as architects, is worthless, and the only course to be adopted when we find architects systematically speaking, writing, and acting in ignorance or in contumaciousness of the fine art of architecture, who can take scornful delight in boasting that they are no artists, and do all in their power to depreciate the art position of those who are more favoured, is to oppose them at every turn, and to carry on a war *à l'outrance*. E. W. G.

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ARCHITECTURAL MILLINERY.

ARCHITECTURAL millinery is that class of unnecessary detail which is used simply because it is thought ornamental, and not because it in any way adds to the utility, comfort, or expression of a building. There is architectural millinery in all styles, and it might, if it would not lead to confusion of idea, be summed up as Flamboyant, as Mr. Ruskin employed that term. It will be remembered how that brilliant writer and deep thinker referred to Japanese extravagances, and to the treatment of the hair in the later Greek sculpture and medals, as Flamboyant. The character which he thus pointed out is so thoroughly embodied in the latest French development of Gothic that such might fairly be referred to as the type of this class of extravagance. There is, however, obviously a chance of our meaning being mistaken if we were to speak of Flamboyant Italian, so we prefer the title we have taken to express the same thing, it being our purpose on the present occasion to consider that particular phase of it. Now, there is man-millinery as well as maidenly, and we fear we must add even a third class, that which is unmaidenly, and yet not manly. The most fantastic freak of the latest Burgundian work has vigour and purpose, if a wrong one, and when it revels in the thorny spikes of its thistle-like foliage, and tosses aloft its complicated leaves, which resemble crinkled cabbage, there is a fancy and freedom about them which to our mind is far removed from the deathly torpor which Mr. Ruskin imagined to be the result of imitating dried-up and decayed vegetation. Only men, even if artistically-depraved ones, could have wrought those marvellous pillars which flank the central western portal of Rouen Cathedral, bossy with tiers of reputed saints, ornamental if scarcely virtuous, huddled together under fretted canopies, to form an abutment for the vast archway, fringed with delicate cusping, and the lacelike pediment above it, of perforated tracery, a mere gossamer veil before other no less extravagant decorations behind. Such is architectural millinery, but of a manly sort not altogether to be derided, and thoroughly effecting the purpose intended by it. The purely feminine sort, however, is composed of the glitter of comparative baubles, and is rampant in the present day; harmless, if costly, its worst fault is that it means nothing. Twisted columns are its delight, and the Beautiful Gate of the Temple, as imagined by Raphael, the greatest of Renaissance painters, might be compared with the other portal we have just described. That, with all its faults, is indeed a beautiful gate, a grand and fairy-like conception; but who, if S. Peter and S. Paul and the lame beggar were gone, would trouble themselves to stop before those gouty specimens of a truly Flamboyant taste? If we turn to the florid descriptions of the press of the last reredos wrought for our own cathedrals at the price of a prince's ransom, twisted columns decked with glass mosaics, agate balls, and similar ladylike millinery, form the staple of the attractions dwelt upon. While we cannot but sigh over the waste in such trumpery of sums that might pay for real art, and by this have raised up the school of decorative artists we so much desiderate, we look with sterner eyes upon architectural millinery of the baser and more meretricious nature which flaunts itself before our eyes in the streets. In those in the City, where, unfortunately, more money has been at command to spend upon such worthless extravagance, we meet with it at every turn. If twisted columns are absurd, what is to be said of still more important features tortured, parodied, and misplaced, pediments cut in two, and the ends curled up; whole orders stuck on to façades, like false shirt fronts, poised upon brackets or monstrous nondescript corbels; wreaths and masks, and heads of marine deities applied without rhyme or reason? Such is architectural millinery, which no fellow can understand, and considering its enormous cost, utter uselessness, and amazing ugliness, one wonders that hard-headed citizens are to be found who consent to have their pockets so rifled as they are by the architects they affect. If a few of the magnates of the profession could be made to pay themselves for all the rubbish they design, and forced, under such a penalty, to give good reason for the architectural faith that is in them, they would soon learn to dispense with such things as they certainly cannot believe in themselves, and for which there is no other epithet so appropriate as architectural millinery. J. P. S.

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HOSPITAL COMPETITION.

A FEW months since Mr. Thomas Holloway invited a select number of architects to send in designs for a hospital, which he contemplates erecting and presenting to the public. He offered £200 for the best design, £100 for the second best, and £50 each to seven of the other competitors; and he obtained the services of Professor Donaldson and Mr. T. H. Wyatt as referees. The following is the report of the arbitrators:—

Sir,—In accordance with your request that we should examine the thirteen designs for the asylum which you are about to erect at S. Ann's Heath, in order to advise you as to those most entitled to the two first premiums which you have offered to the competitors, and as to those entitled to the sum of fifty pounds each, we beg to report as follows. Thirteen designs have been submitted, bearing the mottoes stated below, and arranged in alphabetical order:—

1. "Alpha"
2. "Au bon joueur vient la balle"
3. "Choose the best, place the rest"
4. "Con amore"
5. "Economy"
6. "Humilitas"
7. "Improbus labor omnia vincit"
8. "Mens"
9. "Mens sana in corpore sano"
10. "Progress"
11. "Quadrant"
12. "Sanitas"
13. "Vivere aut vincere."

We have carefully examined the drawings and the descriptions having reference to the suggestions issued by you, and to the requirements of such an institution. We have also had tables prepared showing the numbers and sizes of the principal rooms, and the amount of accommodation provided in those designs which seemed indisputably to be the most promising, together with the cubical contents of the several buildings. You were also so good as to call in the advice of Dr. Yellowlees and Dr. Lockhart Robertson, well known for their experience as able medical superintendents of asylums. We must state that although there is considerable merit and taste displayed in the several projects, and evidence of a great amount of time and care having been bestowed upon the preparation of the drawings, yet there is not one of the designs which would not require more or less modification of plan and general arrangement ere it could be carried into execution for practical working, consequently we have selected that one as first which, with the least alterations and no sacrifice of its own individual character, would, we believe, be the most suited to your purpose, and the least costly. We beg, therefore, to state our opinion that the first prize should be awarded to "Alpha," the second to "Improbus labor omnia vincit," and that the following should, in the terms of your offer, receive £50 each:—

"Au bon joueur," &c.
"Con amore"
"Economy"
"Mens"
"Mens sana," &c.
"Progress"
"Quadrant"
"Vivere aut vincere."

We cannot forbear to notice the series of drawings bearing the motto "Quadrant"—a very original and artistic design, displaying a novelty of conception in the plan, and much picturesqueness in the elevations, but with practical deficiencies and defects which prevented our placing it first or second.—We beg to remain, Sir, yours faithfully,

Signed, Thos. L. Donaldson,
Thos. Henry Wyatt.

Thomas Holloway, Esq.

The following are the names of the competitors, with their respective mottoes:—

1. "Alpha," Crossland, Salmons, & Jones, £200, first prize.
2. "Improbus labor," &c., Alfred Smith, £100. second prize.
3. "Au bon joueur," &c., T. Roger Smith, £50.
4. "Con Amore," R. Phené Spiers, £50.
5. "Economy," J. P. Seddon, £50.
6. "Mens," E W. Godwin, £50.
7. "Quadrant," E. W. Godwin, £50.
8. "Mens Sana," &c., J. S. Quilter, £50.
9. "Progress," T. H. Watson, £50.
10. "Vivere aut Vincere," F. & H. Francis, £50.
11. "Choose the best," &c., Hine & Son, nil.
12. "Humilitas," E. Welby Pugin, nil.
13. "Sanitas," John Norton. nil.

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THE USES OF BLAST FURNACE SLAGS FOR BUILDING PURPOSES.*

(*Concluded from p.* 38.)

THE extremely clean pigs made in this casting bed of granulated slag suggested its further use. The fine dust was sifted out and used to sand the moulds for fine castings. It was found that such castings were much more easily cleaned, and that the iron was quite bright. The result was a better and cleaner casting, and considerable saving in the item of cleaning them.

As these uses consumed but a very small part of the slag, it was offered as ballast to the railroad companies on condition that they should remove it themselves. As the size of the grain can be easily regulated by the velocity and direction of the water, the railroad companies were not slow to avail themselves of these conditions, and soon were glad to pay for it, thus furnishing to the furnace company a revenue from what had previously been a source of expense. The granulated slag weighs 1,200 kilometres the cubic metre. Its cost in France, where it is used, is less than half the price of sand. It is exceedingly porous, so that it retains very little moisture, and yet packs sufficiently; the result is that it will bear transportation long distances, as it is much cheaper than ordinary gravel, and better adapted to the purpose of ballast.

The substitution of the granulated slag for sand in construction suggested itself at the outset, and its use has been attended with excellent results. It was found that some of the slag mortar which had been left over after some repairs where it had been used, became solid after a short time; this suggested its use in the preparation of concrete, and in the construction of foundation walls. A number of experiments were made to ascertain the exact nature of the sand, and it was found that 100 grammes of granulated slag digested in 100 grammes of water containing 0·15 grammes of lime in solution absorbed in forty-eight hours 0·052 grammes, the water at the end of this time retaining only 0·098 grammes of lime in solution.

The manufacture of bricks from this material immediately suggested itself. Persons who have been in the habit of travelling on the Rhine will probably have noticed in the vicinity of Neuwied long rows of white bricks of all shapes, pipes, and more or less complicated pieces for building purposes, piled drying in the sun. This material is manufactured from a granulated pumice which is found here at a depth of a few inches from the surface. It is simply mixed with lime, pressed, and sun-dried. It is very extensively used on the Rhine and in its vicinity. It is of this material that the interior arch of the roof of Cologne Cathedral is said to be constructed. This pumice resembles the granulated slag. The proprietors of the Georg-Marien Hutte, in Hanover, adopted the suggestion, commenced the manufacture of this kind of brick from slag, and are so well satisfied with it that they use it in the place of bricks for the construction of their buildings. The bricks there, at the time of my visit, were made at some disadvantage with imperfect machinery, yet they cost much less than ordinary brick. Once out of the machine the bricks are simply sun-dried, and can be very quickly used in construction. They give a light cheerful air to the buildings, and make a warm and exceedingly comfortable house at a very small cost. It is remarkable what can be done when the necessity exists. I saw at Kreutznach on the Rhine, and in the Siegen district, bricks made from ordinary coal ashes mixed with lime and sun-dried, which had stood, during several years of exposure, with no sign of deterioration. The manufacturer assured me that there were seven or eight large establishments for the manufacture of this coal ash brick in Germany.

In some parts of Europe there is a demand for bricks covered with an enamelled surface. By coating the surface of the unburned brick with granulated slag and then burning it, out of the direct contact of the coal, it was found to produce an enamel of different colours, varying with the composition of the slag; and it is suggested that such bricks as these can be made without any extra cost by simply replacing the ordinary sand with which the men cover the tools, to prevent the adherence of the clay with the granulated slag sand. It might be used to advantage in the manufacture of tiles, drain pipes, and coarse pottery generally.

By mixing a certain proportion of this granulated sand with clay it was found that the articles so manufactured were capable of undergoing sudden changes of temperature without breaking. This suggested the use of a certain amount of the artificial sand in the manufacture of firebricks; and after a certain number of preliminary assays in a blacksmith's forge, a furnace for melting brass was constructed in making the firebricks, for which the calcined sand was replaced by granulated slag. These bricks were quite as serviceable as any others, and underwent no alteration after three months' trial. It is proposed now, after a sufficient number of assays shall have been made, to use this material in the manufacture of bricks for the puddling furnace.

Another application of the granulated slag is its use for agricultural purposes. The important part which carbonic acid plays in rendering soluble the different mineral substances which plants require for their growth is well known. It was found that by digesting 100 grammes of granulated slag in water charged with carbonic acid for a period of forty-eight hours, 1·6 grammes had been dissolved. This renders it probable that it can be very profitably used on calcareous soils, while the large quantity of lime contained renders it likely that it will prove equally serviceable on silicious soils. The very fine state of division to which it may be reduced at a very small cost is favourable to its decomposition in the soil.

Blast furnace slags gelatinise in acids, and they are, therefore, very suitable for the manufacture of cement. Pelouse and Fremy, in the last edition of their work on general chemistry, cite them as being eminently fit for this purpose.

The possibility of having them in such form as granulated slag reduces the price of the pulverised material to a sum so small that in certain parts of Germany an artificial cement, equal in every respect to the best Portland cement, is manufactured at a price so low as to yield a large profit, and yet very much undersell it. Very large works for the manufacture of this artificial cement are, during this year, to be constructed on the result of experiments, lasting over several years, at one of the large German iron works.

Considerable attention has been paid in Belgium and Germany to the use of the slags for the manufacture of chemical products. These were first salts of alumina, then salts of lime as an incidental product, and lately the use of the silica extracted for the manufacture of soluble glass. This, of course, necessitates the location of the blast furnaces at some point near a large acid manufactory. It does not seem likely that this method will ever be used on a large scale in this country, where material containing a much larger percentage of these substances can be had almost as cheaply as the granulated slag, which must, of course, be used to bring the manufacture of chemicals even within reach of probable profit.

In certain conditions of the furnace the slag is spun by the blast into fine fibres, and makes a substance which is sometimes called "furnace wool." This material is a very bad conductor of heat, and it has recently been proposed to use it as packing, to prevent loss of heat about boilers, &c.

I have thus rapidly sketched some of the uses to which this hitherto worse than useless material may be put. But few of these are likely to find any application in this country. The manufacture of paving stone where good material for that purpose is wanting, may be carried on successfully. It requires but little care, but the slags must be of very nearly constant composition, and must not change their form after cooling. The material, when properly made, wears well, and has been laid in some of the cities of Europe, under severe tests, for several years. I have a number of such blocks in the metallurgical collection of the School of Mines, taken up after seven years' use, at my request, from the streets of one of the largest cities in Europe.

The manufacture of the granulated slag bricks, when wood for building purposes is cheap, is not likely to come into use. But in every case where brick or stone is to be used it is cheaper and preferable, and the manufacture once started, it is more than likely that if such bricks will stand our severe climate—and there seems no reason why they should not wear here as well as in the large establishments where I saw them used—they will be adopted for these constructions. The use of the slag in the place of sand will follow, as a matter of course, when it is granulated, and also its use for agricultural purposes.

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* A paper read before the American Institute of Mining Engineers by T. Egleston, E.M.

The most valuable of all the uses, however, is that of cement. I have seen cement equal to any of the best Portland cement made at a very small cost, and this from any slag, no matter how the composition varies. The great advantage of having a suitable substance for the manufacture of cement, in such a condition that at very small cost it can be reduced to an impalpable powder, is apparent. This manufacture of cement is not to be confounded with the adulteration of cement by slag, which is said to be carried on, on a large scale, in England. The slag before it is manufactured, will, of course, deteriorate the value of the cement with which it is mixed, though it is a better adulteration than ordinary sand, and may perhaps be honestly undertaken in the belief that the pulverised slag alone has some of the properties of cement. The construction of a large manufactory, after several years' experiment in one of the largest works in Germany, seems to be a guarantee that we may hereafter use cement in construction more freely, and be able to procure at a small cost a better article than we now have.

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BUILDERS' BENEVOLENT INSTITUTION.

The twenty-fifth annual meeting of the subscribers and friends of this charity was held yesterday (Thursday) at Willis's Rooms, King-street, S. James's. The chair was taken at 3 p.m. by Mr. James Simpson, in the absence of the President, Mr. Joseph Taylor. The notice convening the meeting having been read, Mr. A. G. Harris, the secretary, read the minutes of the last annual meeting, which were confirmed. The secretary then read the report, which was as follows:—"In presenting the 25th report to the friends and supporters of the Builders' Benevolent Institution, the directors have the satisfaction of informing them that they have, through their kind assistance, not only maintained their previous position, but have increased the number of their annual subscribers during the past twelve months. Four pensioners have been elected during the past year—two in November, 1871, and two in May last. The pensioners elected in November, 1871, were Mr. W. Gale and Mrs. M. St. George; those elected in May last being Mr. M. Mintry (blind), and Mrs. J. Brothill. The pensioners deceased during the past year were: Mr. G. L. Williams, elected May, 1866, died August, 1871; Mrs. A. Buckingham, elected May, 1857, died August, 1871; Mr. G. Hunt, elected May, 1867, died November, 1671; Mrs. M. A. Farnell, elected May, 1861, died December, 1871; and Mr. W. Taylor, elected May, 1863, died February, 1872. During the past year £752 16s. 5d. Stock, Three per Cent. Consols has been added to the funded property of the Institution; £643 14s. 5d. for the Relief Fund, and £109 2s. for the Building Fund, making a total of funded property of £16,142—£12,781 9s. 6d. for the Relief Fund, and £3,360 10s. 6d. for the Building Fund. The amount purchased for the Relief Fund includes the sum of £321 18s. 10d. received from the executors of the late Richard Alchin, Esq., of Brighton and Tonbridge Wells, who was a liberal supporter of the charity from its commencement. The annual ball, held at Willis's Rooms, King-street, S. James's, in January last, produced a profit of £76 6s. 7d., being an increase over the previous year of £21 16s. The directors, in thanking their kind supporters for their generous and continuous efforts, which have enabled them to assist so many of their unfortunate brethren, hope that (there being so many applicants) they will not cease in their efforts, but endeavour themselves and through their friends and connections to procure additional funds, so that they may elect a larger number at the next election. They have also the pleasure of announcing that Edwin Lawrence, Esq., has kindly consented to be the President of the Institution for the ensuing year." Mr. Harris then read the balance-sheet for the year from June, 1871, to June, 1872, which showed the receipts to have been £2,832 19s. 10d., and the expenditure £2,395 11s. 1d., leaving a balance in bankers' hands of £437 8s. 9d. On the motion of Mr. Joseph Bird, seconded by Mr. Thos. Stirling, it was resolved that the report and balance sheet be received, adopted, and printed. Resolutions were then passed thanking the patrons, the President (Joseph Taylor, Esq.), the Vice-Presidents, the trustees (Sir S. Morton Peto, Bart., Sir J. C. Lawrence, M.P., Charles Lucas, Esq., and G. Spencer Smith, Esq.), the Treasurer (Geo. Plucknett, Esq.), the Directors, the hon. sec. to the Ball (Mr. Joseph Bird), the auditors (Mr. S. H. Head and Mr. J. H. Hunter, and to the hon. solicitors, Messrs. Jacques, Edwards, & Co., for their services to the Institution. Mr. Joseph Taylor was added to the list of Patrons, and the following gentlemen were added to the list of Vice-Presidents: Messrs. G. Dines, R. Giles, M. Hall, G. Head, W. Lee, and E. Whillier. The following Directors retiring by rotation were re-elected: Messrs. C. Fish, F. W. Keeble, Jas. Simpson, T. G. Smith, J. Thorn, S. J. Thacker, and J. Waldram; and Messrs. R. K. Burstall and G. R. Macey were elected new Directors. On the motion of Mr. Joseph Bird, seconded by Mr. T. Stirling, it was resolved that Edwin Lawrence, Esq., be the President of the Institution for the ensuing year. A vote of thanks to the Chairman, Mr. James Simpson, brought the business to a close.

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WATER SUPPLY AND SANITARY MATTERS.

Constant Water Supply for London.—The regulations as to the water supply of the metropolis are now being considered before Lord Methuen, Captain Tyler, and Mr. R Rawlinson, who have been appointed by the Board of Trade for that purpose. Mr. C. Pollock, Q.C., and Mr. Beasley appear as counsel for the water companies; Sir J. Karslake and Mr. Bidder for the Metropolitan Board of Works; and the Hon. A. Thesiger for the Corporation of London.

Hertford.—On the 12th inst. Mr. R. Morgan, Government Sanitary Inspector, held an inquiry at Hertford as to the extension of time stated to be required by the Hertford Corporation to enable them "to provide means for the prevention of the flow of sewage or other offensive matter from their district into the River Lea." On the part of the Corporation, it was stated that all necessary steps had been taken to do the works, but it took time to get the contracts out, and obtain the money. There had been delays owing to the heavy falls of rain and the large quantity of spring water to contend with; but they had been pushing on the works, and in three months time would have them complete. Further time was therefore applied for. On the part of the Lea Conservancy Board, the application was opposed, it being stated in evidence that the stream was greatly polluted. After inspecting the works, Mr. Morgan granted the extension of time up to the 1st October next.

Liverpool.—The Liverpool water reservoirs at Rivington are full to the brim, an unusual state of things at this time of the year, but easily accounted for by the exceptionally wet season.

Windsor Castle.—Extensive works are now in progress for the drainage of Windsor Castle and the utilisation of the sewage of the Palace and Frogmore House. Some months back a site for the reception of the sewage was chosen upon the Ham, at Old Windsor, two or three miles from the Castle, and a field of several acres in extent near the old course of the Thames, and between the latter and the navigation cut which leads to the Bells of Ouseley, was prepared by a number of the Foot Guards, and gangs of navvies. Immediately after the departure of her Majesty from Windsor Castle the works at the Palace were commenced by the excavators. Earthenware pipes have been conveyed to various places in the Home Park and along the route to the Ham at Old Windsor, where the sewage is to be used, and it is expected that the system will be completed before the return of the Queen in the winter.

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At No. 110, Fenchurch-street, a warehouse has been pulled down and a number of offices are to be erected in its stead. The building will be faced with glazed white Suffolk bricks, with Portland dressings. The offices in the rear of the building are also being re-erected. Mr. T. Chatfeild Clarke, of Bishopsgate-street, is the architect, and Messrs. Newman & Mann, of Peter's Hill, Doctors' Commons, are the builders.

The grocery warehouse and shop belonging to Messrs. Tomlin, Rendell, & Co. at 33, Eastcheap, is being rebuilt with a Portland stone face, having granite dressings by Mr. Pritchard, of Hall-street, Finsbury, under the instructions of Mr. Woodthorpe, architect, Moorgate-street. The building is to be carried up to the level of the range of offices adjacent.

Purssell's confectionery shop, 80, Cornhill, is being rebuilt, and a luncheon bar is being added. It is to be faced with Beart's white bricks, with Portland stone dressings; panels of Pether's ornamental patterned bricks are to be inserted in the principal front. Large vaults are being excavated beneath the building. Messrs. Humphries & Son, of Leadenhall-street, are the architects; builder, Mr. Wm. Henshaw, City-road Basin.

Building Intelligence.

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CHURCHES AND CHAPELS.

Ashton-upon-Mersey.—On Monday the foundation stone of the new church of S. Mary Magdalen, at Ashton-upon-Mersey, was laid. Messrs. W. Wilson & Oldham, John Dalton-street, Manchester, are the architects. The nave will be 83ft. long by 41ft. wide, and the chancel 30ft. by 19ft. Sittings will be provided for 650 worshippers. The building will be erected in the Early Decorated style, at a cost, exclusive of the site, of between £5,000 and £6,000. Mr. Kirkley, of Sale, is the contractor.

Barrow-in-Furness.—The foundation stone of a new Baptist Chapel was laid in the Abbey-road, Barrow-in-Furness, by the first Mayor, Sir James Ramsden, on the 17th inst. The chapel is to be erected in the Byzantine style, with a handsome tower fronting the road, and will provide accommodation for about 500 persons, at a cost of nearly £2,000. Mr. Worrall, of Barrow, is the architect; Mr. Gradwell the contractor.

Birkdale. — The new district church of S. Peter, Birkdale, was consecrated by the Bishop of Chester on Tuesday morning, the 23rd inst. The church consists of a nave, chancel, north and south aisles, organ chamber, and tower. The style adopted is Geometric Decorated, of the earlier portion of the fourteenth century. Brick has been used in its construction, with facings of Upholland parpoints and Cefn stone dressings. The tower is at present unfinished. It will be about 52ft. in height, an octagonal staircase in one angle being carried up and finished with a small pinnacle 70ft. from the ground. An arcade of Westmoreland granite columns supports the clerestory, which is pierced with quartrefoils. Sittings are provided for 550 persons. Messrs. T. D. Barry & Sons have designed and carried out the whole of the works.

Chester Cathedral.—Last week, while some of the workmen at the Chester Cathedral were engaged pulling down a portion of the wall at the west end of the Cathedral enclosing the staircase to the Old Bishop's Palace, they discovered a portion of the old shrine of the Cathedral, in an almost perfect state of preservation. It was at first thought to be part of an ancient monument, but after careful examination and comparison it was found to be a part of the old shrine, the remainder of which forms part of the bishop's throne in the choir. A portion of the relic was found to be in fragments, and care is now being taken so to adapt the parts as to form a perfect whole.

Little Newcastle Church.—It having been found necessary to rebuild this church on an enlarged scale, a contract for the first portion of the works has been taken by Mr. Thomas Richards, of Letterston, and the foundation stone has been laid. A small portion of the old foundations will be used, but with this exception—none of the old building will be left standing. Mr. E. H. Lingen Barker, of Hereford, has made the plans, and the several works will be carried out under his superintendence.

Southleigh.—The parish church of S. James, Southleigh, Oxon, was reopened on Saturday week, after restoration by Mr. Groves, of Milton, under the direction of Mr. C. Rolfe, of Reading. A new high altar has been erected, the altar cross being of olive wood grown on Mount Calvary. The south perch has been rebuilt, and the building reseated throughout. The curious wall paintings discovered in the church have been restored by Messrs. Burlisson & Grylls, of Newman-street, London. The subjects are "The Resurrection," "S. Clement of Rome," and "The Annunciation." It is noteworthy that in the ancient pulpit of this church John Wesley preached his first sermon in 1726.

Victoria Park.—On Thursday week, the foundation stone of a new church for S. Mark's district, Victoria Park, was laid. The church will be built by Messrs. Browne & Robinson, from the designs of Mr. Blomfield, in the Early English style of architecture, on a cruciform plan, consisting of nave, side aisles, transepts, and chancel. The roof will be open, and the building when completed will accommodate 700 worshippers.

BUILDINGS.

Blackburn.—The foundation stone of the New Free Library, at Blackburn, was laid on the 11th inst. The library having greatly improved in importance and extent, it was decided to remove it from its quarters at the Town Hall, and in the course of 1871 it was finally decided to secure four plots of ground on the south side of Richmond-terrace, and abutting upon Frances-street. In response to advertisements issued by the committee, 38 sets of designs were submitted in competition from architects in all parts of the kingdom. The committee selected eight sets of drawings, and delegated the task of choosing the one to be adopted to Mr. Alfred Waterhouse. He awarded the palm to Messrs. Woodzell & Colcutt, architects, of Finsbury-place, London, who have been commissioned to superintend the construction of the proposed building. The principal front of the building will be in Frances-street. The principal entrance will be in the centre, and a spacious vestibule will be provided leading to the hall and staircase. On the right of the entrance hall will be the lending library, and on the left will be the reference library, some 34ft. in width, but having an arcade of columns the whole length of the room, reducing the part for the reading tables to about 24ft., and forming alcoves for the book-cases. The columns and arches will be of stone, the former circular on plan with moulded bases and carved caps. The two libraries will contain about 160,000 volumes, and will give accommodation for 80 readers. The students' reading-rooms, two in number, will be at the end of the reference library. The librarian's room will be placed opposite the entrance to the hall, commanding every doorway; it will extend the whole width of the hall, and communicate direct with both libraries. On the right of the entrance will be a ladies' reading-room. The grand staircase will be of stone. The whole of the first floor will be devoted to the purposes of a museum and picture gallery, one room, with an open-timbered roof, being of sufficient size to serve as a lecture-room. Stone will be used internally about the doorways and windows, also for skirtings, principally from the Bath quarries. The floors will be constructed on Fox & Barrett's system. The style of the building is Early Decorated. Bradford pier-points will be used for the fronts, with Longridge stone dressings, and there will be three tiers of carved string-courses in Warwick stone, from near Huddersfield. Messrs. Marshall & Dent are the contractors, the amount of their tender being £6,929. This is exclusive of fittings. Mr. Simpson is the clerk of works.

Blackburn.—The Town Hall Assembly Room, Blackburn, has just been reopened, after redecoration at a cost of about £1,100. Messrs. Embley & Pilkington, of Feilden-street, Blackburn, carried out the work. The gas pendants hitherto in use have been wholly removed, and two large sunlights have been substituted for them.

Gaiety Buildings.—Extensive building operations are in progress connecting the Gaiety Theatre with the restaurant in Catherine-street, Strand. For this purpose a number of shops have been taken down, and in their stead a private hotel will be erected, the style of which will be in harmony with the buildings it connects. It is to be faced with white Suffolk bricks with Bath stone dressings. The columns supporting the windows are of red Mansfield stone with plinths of Pennant stone. Mr. C. J. Phipps is the architect, Mr. Simpson, of Tottenham Court-road, the builder. It will be remembered that the Gaiety Theatre was originally opened as the Strand Music Hall, but that enterprise did not prove successful.

Winchester.—The works in connection with the new Town Hall are being actively proceeded with. Next week the sculptors begin the carved work of the numerous capitals and other enriched portions of the front. There will be four statues on column pedestals; they are to represent eminent personages in the early history of the city—Egbert, Alfred the Great, Florence de Linn (first Mayor), and Henry III., born at and surnamed "of Winchester." On a large panel, level with the general parapet at the springing of the clock tower, there will be a tableau in bold relief of Henry II. granting the first charter to the city; and in the six tympana over the principal window will be shown—1. Establishment of the Order of the Round Table by King Arthur; 2. The crowning of Egbert; 3. King Alfred holding his court at Winchester; 4. Canute hanging up his crown in the Cathedral after rebuking his courtiers on the shore at Southampton; 5. The compiling of Domesday Book under William the Conqueror; 6. The marriage of Philip of Spain with Queen Mary at the high altar of the Cathedral.

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The Council of the Royal Architectural Museum announce, as some of the results of the Conferences recently held with art-employers, that two courses of lectures or explanations of the casts in the museum, kindly offered by Mr. J. F. Redfern and Mr. William Brindley, two members of council, were arranged to take place at this season, but that in consequence of the unsettled state of the building trades it has been decided to postpone them until the autumn. Classes for drawing and modelling for art-workmen will then be opened, of which further notice will be given.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Received.—E. A.—H. W. W. & Co.—J. J. T. & Co.—W. H. S. & Co.—W. J. C.—N. M.—G. & V.—A. F.—G. H.—E. R. T.—J. H.—T. R. W.—A. S.—Athurus.—Th. B.—J. P. S.—Westward ho!—J. T. W.—T. R. S.—J. N.—J. H.—E. W. P.—Symbolical.—W. S. & Co.—E. B.—W. B. B.

A Plymouth Reader.—The papers in their entirety can only be had by members of the Institution of Civil Engineers.

Economy.—The matter in dispute has too many local bearings and connections for us to offer an opinion on it.

Thomas Batterbury.—We quite agree with you, and have decided to have a title-page competition, and beg to offer £5 5s. for the best title-page for the Building News. The particulars next week.

T. R. Williams.—The photographs to hand.

Goulty & Gibbins.—The Elliott Memorial Schools next week.

E. M. J.—Indicate your suggestion more definitely, and we will forward it to "E. W G."

W. A.—Your query involves considerations somewhat beyond our jurisdiction. The subject has been treated rather fully in the *English Mechanic.*

Alfred Reading.—The prize drawings to hand.

A. T. W.—Thanks. Declined and returned.

T. R. Smith.—Thanks. You will see a notice of the book appears this week.

E. M. J.—Inadmissible.

E. L. Galizia (Malta)—Your question has appeared and has been replied to. Send line drawings of the building you wish illustrated.

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Correspondence.

"ON MODERN SCOTTISH ECCLESIASTICAL ARCHITECTURE."

To the Editor of the Building News.

Sir,—As this subject is of interest chiefly to Scottish architects and the Scottish people, an opinion upon it from the capital of the country—and that capital "the modern Athens"—is only what naturally might be expected; if "a heretic blast has been blawn in the wast," that wise men should come from the east to endeavour to silence it is no more than what confidently might be looked for. There accordingly appeared, in your issue of the 12th of July, "Another Protestant and Architect" addressing your readers from Edinburgh upon "the harsh attempt of Mr. Gildard to throw discredit on the progress happily made of late years in Scotch church architecture." I will, with your leave, set the soft endeavour opposite to "the harsh attempt," and see how they look at each other.

"Another Protestant and Architect" calls attention to my "inconsistency in calling out for a plainer and more simple style of edifice and service, and for the Greek as the best exponent of his Puritan ideal;" and he says that I tell your readers "that the Greek is the true style for Protestant Churches, because its beauty aims at unadorned simplicity!" Now, all that I said of Greek is, that one of the most beautiful and most comfortable Presbyterian Churches in Glasgow is Greek; that "if any consideration is to be given to the plea sometimes urged that to the Church ought to be given nothing less than the best achievements of human genius, then Greek architecture must be much more appropriate than Gothic," and that Greek "has this further advantage, that its associations are not, as are those of the Italian and Gothic, with a corruption of Christianity, but with an innocent ignorance of it." I fear that "Another Protestant and Architect" has been looking at my argument through that "luxury of stained glass," and in that "spirit of Gothic complexity," of which he speaks in subsequent paragraphs. Mr. Honeyman, however, said that "it might be fairly questioned whether, after all (having regard to the special requirements of the building), the Classic style is not absolutely the most suitable for a Presbyterian place of worship."

"Another Protestant and Architect" then "takes serious exception to Mr. Gildard's assumption (for it is nothing more) that Gothic is the mother of abominations," and tells me that "the corruptions he deplores rose and ripened under the shade of Classic buildings long before the Lombards had crossed the Alps." The subject before us is "Modern Scottish Ecclesiastical Architecture," and I expect that "Another Protestant and Architect" will agree with me in this that Scotland is Christian, Protestant, Presbyterian; neither Jewish, Pagan, nor Papal. If Scotland be so, then I need have no hesitation, not in "assuming that Gothic is the mother of abominations," but in repeating that Gothic's associations are with a corruption of Christianity. And as I have said the same of the associations of the Italian, perhaps there would be but little between "Another Protestant and Architect" and me if "Another Protestant and Architect" embraces Italian in the "Classic." "Another Protestant and Architect" must first find me fall before he tries to lift me.

Stained glass is defended by "Another Protestant and Architect," not upon an "ecclesiastical," nay, not even upon an æsthetic, but upon a utilitarian consideration. As to stained glass, he thinks "this luxury an absolute necessity to counteract the mesmerising influence of the glare and vacuum that seems inevitable in the plain tea-caddy style which is being superseded." If stained glass be an absolute necessity only for a style "which is being superseded" neither "Another Protestant and Architect" nor I need waste many words about it. As, however, our Cathedral is in a style which is being superseded by a "Gothic" that is petty and pretty, trim and neat (Samson after having been shorn), and as stained glass has been deemed to be an absolute necessity for its windows, I may say that "this luxury" in this instance, instead of having counteracted glare has only increased it.

"It appears, moreover," from "Another Protestant and Architect," that I am "not a very consistent admirer of primitive simplicity;" that I "commend some specimens which certainly are not unadorned." "What does this show," is then triumphantly asked, "but that the Classic satisfies our feeling of the beautiful just in proportion as it escapes from uniformity and borrows the spirit of the Gothic in the complexity of its details and picturesqueness of outline?" When two things differ in kind and purpose there can be no inconsistency in commending the one and condemning the other—in commending the beautiful in the abstract, and in condemning "the introduction of stained-glass windows and coloured mural decorations" as a "change for the better in the old-fashioned services of the Scottish churches." I merely said that some of the most beautiful and most comfortable Presbyterian churches in Glasgow are not Gothic, which is not commendation but a simple statement of fact; and that the Dissenters had in Glasgow, long prior to 1843, some churches that if then "unobtrusive and unadorned," at least now commanded a rather respectful regard, that is as architectural works, and not because of their special fitness for their purpose, meeting-places for worship. The extraordinary opinion that "the Classic satisfies our feeling of the beautiful just in proportion as it . . . borrows the spirit of the Gothic in the complexity of its details" needs no comment.

"Another Protestant and Architect" skilfully leaves his strongest arguments to the last, those founded upon Scripture. One of these is that S. Paul always preferred the synagogue where he could get it. The synagogue was a place where the Jews assembled to worship, but, unfortunately for "Another Protestant and Architect's" argument, S. Paul was pre-eminently the apostle of the Gentiles. Another of his arguments is that the Christian disciples were quite familiar with instrumental music, they were continually in the Temple, and joined in its worship to the last. In fact, the construction of many of the Psalms is highly artistic, and based on the alternations of vocal and instrumental song, and if I will turn up the 150th Psalm he is sure I will be satisfied that what was good for the author of that Psalm, for S. Peter and S. Paul, and the Christians of the first century, we may be allowed to have (if we desire it) in 1872. I have no knowledge that the disciples joined in the instrumental music of the temple, but this I know that one of them says "Is any merry? let him *sing* psalms;" and I know also that S. Paul repeatedly refers to the *singing* of praises: "I will sing with the spirit and I will sing with the understanding also;" "singing and making melody in your heart to the Lord;" "singing with grace in your hearts to the Lord." But where in the New Testament is the authority for instrumental music in worship? I am taken to the Old and asked to "turn up" the 150th Psalm. I have done so, but "turning up" the Psalms may carry "Another Protestant and Architect" much further than he would desire to go, for I find in the Psalm immediately preceding, "Let them praise his name in the dance," and we are told in Samuel that David danced before the Lord with all his might; and David was girded with a linen ephod." Now, "Another Protestant and Architect" must excuse me for saying that after having read these passages I am *not* "satisfied that what was good for David we may be allowed to have (if we desire it) in 1872." Let "Another Protestant and Architect" try it.

I would have no hesitation about "pardoning" "Another Protestant and Architect" for his suggestion that I "might walk out in fustian or corduroy as the primitive architect modelled on the fashion of the *Quarterly Review*," were it not that as "two stars keep not their motion in one sphere," perhaps "Another Protestant and Architect" walking out in "fustian" is enough; however, if it were possible for me to go the Conference, I would have pleasure in going in corduroy, or in even the kilt, believing that I would be there esteemed not for the clothes that I wore but for the opinions that I expressed. There are men who are indebted for their *vis* in society to their boots, gloves, and neckties, while others assert it by the clearness of their heads, the warmth of their hearts, and the purity of their lives; in like manner there is a Christianity that is supported by painting, sculpture, architecture, music, rhetoric, and dress, and a Christianity that lives by the spirit and by the understanding.—I am, &c.,

Thomas Gildard.

Glasgow, July 22.

LAYMEN *VERSUS* MODERN CHURCHES.

Sir,—It is really singular how we, as a body of highly important and, as we flatter ourselves, intelligent men, agree to maintain silence and to waive criticism with regard to a building to which we return Sunday after Sunday, and with which our most sacred and momentous interests are bound up. Throughout the realms of science and art, in every department of human interest, either social or political, we plume ourselves upon our right of private judgment, and exercise it unsparingly. It may be said that in these days our chief function is "criticism," and from the last new "Cabinet" to the cut of our neighbour's coat or his fair partner's headgear, nothing escapes it. We are fierce as politicians, we are very men-slayers of public men. The artists find us hard to please, whether of music, painting, poetry, or literature. We talk to them like offended fathers, a little foolishly, gravely censorious. We mete out to our "tradesmen" grim justice with no mixture of mercy, and treat our tailor as the scapegoat of his class, whose fate is to die in the wilderness of our displeasure, under the weight of pitiless jeers and unpaid bills. As for the fate of our friends and neighbours, who can express it? The mercies of the dissecting room, of the old practitioners before the advent of homœopathy, the rack, all the museum of tortures to be found in the Inquisition, were many times preferable to it. But in the midst of this courageous assertion of our right to criticise all things human and divine, we maintain absolute silence with respect, not to the world we live in, but to the church we worship in. This singular product of modern ingenuity enjoys the immunity of that happy shore, described by the poet "Where tempests never beat nor billows roar." It is the green oasis unvisited by the sand-storms of sarcasm, and is sacred to ecclesiological clergymen and their shadows—the architects. Sir, a very ordinary occurrence has turned my attention to the subject upon which I venture to address you. The summer having come, my clergyman has taken a trip to the Continent and the church is shut up—I am told for the purpose of cleaning it. I am in the position of a sheep shut out of the fold, the doors of my church are closed against me, and I am free to wander where I will. I have accordingly visited several of the churches of my native town, the interiors of which were previously unknown to me. I attend service at a different church each Sunday. Extended observation has shown me that churches greatly differ, that there are light and dark churches, clean and dirty ones, fashionable, and those that are almost ignored by the well-dressed—churches in which you can see nothing, and others again in which you can hear nothing. There are churches old fashioned in the Anglo-Greek style, sacred to high pews and dark French polished altar-pieces and carved festoons of flowers; and there are churches new fashioned in the newest style of what is called Gothic. My own church is in this Gothic style, but it does not date from the times of either the Edwards or the Henrys—it is in every sense a modern building, and has scarcely worn out its first coat of whitewash. My seat is in the transept and close to the organ. When the instrument is being played, the vibration is so great that I tremble like an aspen leaf in the wind. But I have the advantage of being able to see into the opposite transept—of what is done in the chancel I know nothing, for it is impossible for me to see into it. I have neither the power to see through a stone wall nor round a corner. But I am better off than my friend Jones, for I have my view into the transept, but he, since he first took his seat in the church (he had no choice of seats), has never once seen the altar, the minister, or the congregation. A huge stone pillar stands immediately before him, and wonderfully limits the range of his vision. His seat being in the side aisle, in order to see the east end of the church he must look diagonally, but then this said pillar is some 18in. in front of him, and in the direct line of his vision. Jones knows his pillar by heart, it is a very fat one, and has carved wheat-ears with very short stalks stuck round its capital. There is a little row of gas-jets round the top of the pillar, which, when lighted for evening service, are something for Jones to look at. He describes the service as falling rather flat behind his pillar. When the Lessons are read he would like to see the face of the reader, and to listen to the sermon without catching a glimpse of the preacher seriously impairs its effect in his estimation. He especially regrets that he cannot see the congregation, for instead of feeling himself part of it, and sharing in its emotions, he seems quite cut off and left to himself and his big pillar. Jones has entire confidence in his clergyman, but for all he would know to the contrary, the greatest extravagances of "ritualism" might be carried on in front of the sacred table. They would be quite beyond the range of his vision. Can you tell me, sir, what purpose this big pillar serves that is such an eyesore and affliction to my friend? I can see very plainly that it helps to support the wall of the church, and that if it were taken away the wall would come down with a run. But why was it ever placed there with a wall on the top of it? Why was the plan of the church so arranged as to require its presence and that of its seven fellows at all? Is it an ingenious device for mortifying those of the congregation who are forced to have their seats behind them? Is it the clerical mode of putting naughty children in the corner with their faces to the wall, where they can see nothing and are left to their own devices? I have heard tell of a "Gothic revival," and I believe a history of it has recently been written by an architect. Have these rows of pillars been raised in its hot-bed? The forcing-house might have been used to better purpose, one would think. Where, sir, is the workshop in which these buildings are fabricated? Would that we could reach the Mediævalising parsons and doting architects who have the control of these matters; we would tell them that we are sick of the fashion of their buildings, that they fall short of the requirements of a modern congregation. They may be pretty as models and toys, but are too straight for the accommodation of an ever-increasing population. They are inadequate as the expression of the spirit of a national church, which aims at finding place for all in its temples, and values a man more than a pillar. At this moment in all our large towns and manufacturing centres the church accommodation falls utterly short of the needs of the prodigiously increasing people—churches can only accommodate hundreds where they should find room for thousands. The cost of erecting new churches is ever on the increase, and the funds for their erection in our largest towns are limited in the extreme. Surely, in the presence of these facts it is almost criminal to waste thousands in building churches whose only merit is that they are indifferent copies of ones that were beautiful and fit three hundred years ago. No church should be suffered to be built now whose internal space is not clear from external wall to wall, or if aisles there must be, they should be shallow and used as passages only to the uninterrupted area of the church, from every corner of which the entire building should be visible. Is it impossible to unite impressive architectural effect with such a building? Then the baldness of the "meeting-house" is preferable to these stone quarries of fashionable churches. In the former you can see and hear, whereas in the latter you can only see the imbecility of the architect, and of those who laid their heads together with his.—I am, &c.,

A Layman.

NOTES ON EARTHWORK.

Sir,—I am obliged to "Hurtmore" for pointing out the error in the last number of this series of "Notes." I have referred to the original memoranda, and find that the last item in the account of the sewer he mentions is £0 5 0, whereas it is printed "£5 0 0." If it be thus corrected it will be found that the total comes to the sum set down, and that the resulting price per yard remains unaffected.—I am, &c.,

The Writer of the Article in Question.

COMPETITIONS AGAIN.

Sir,—I enclose you a circular containing instructions for a competition. The Birmingham Architectural Society want drawings of certain old buildings, and here is their munificent offer. Their object certainly cannot be to encourage students, or why do they retain the drawings in return for the miserable premiums offered? I hope the architectural students of Birmingham will let their superiors see that although they would gladly compete against each other for honour only, and each of course retaining his drawings, they decidedly object to competing for the chance of selling their labour for the sum of £3 3s., £2 2s., or £1 1s.—I am, &c.,

Esprit de Corps.

Birmingham Architectural Society.—The Council of the Birmingham Architectural Society invites pupils and assistants, under twenty-five years of age, in the offices of members of the Society, to send in sketches and drawings of interesting buildings, and other architectural subjects, for which they will award the following premiums—namely, three guineas for the best, two guineas for the second best, and one guinea for the third best set of drawings, the merits of which will be determined by the Council of the Society. The subjects for sketching this year are portions of King's Norton and Solihull Churches, and the Collegiate Church of Wolverhampton; the selection of which is left to the judgment of the student. The Council recommends elevations to be drawn to a scale of 8ft. to 1in. The sketches and measurements taken upon the spot to accompany the finished drawings. The drawings are to be in pencil, Indian ink, or sepia. The premiated drawings to become the property of the society, all others will be returned to their authors. The drawings to be distinguished by a motto or device, and a letter containing the author's name, with a similar motto outside, to accompany them, which are to be delivered, free of expense, to the Honorary Secretary, on or before the 1st day of December next.—Henry F. Talbot, Hon. Secretary, 56, Ann-street, Birmingham, 13th July, 1872.

ILFRACOMBE.

Sir,—I ask you, in justice to my client, Mr. Camp, the builder Mr. Norman, and myself, to allow me to contradict a statement that appeared in your paper of July 12th to the effect that the stone terrace of a villa being erected from my designs in Ilfracombe was likely to break down if many people were upon it. I pass over one portion of your correspondent's report, in which he gives an elaborate description of a villa being erected from the designs of Mr. Oliver, architect, which is certainly deserving of all praise, but says nothing whatever about a fine villa erected by Mr. Lauder, architect, and merely notices the restoration of the parish church, the houses and shops in High-street, the Foresters' Hall in Oxford-street, and the said villa for Mr. Camp, all of which are being erected from my designs, the only remark he favours me with being anything but complimentary, as well as utterly incorrect, and his fears for the safety of the terrace the result of his own fertile imagination. I should occupy too much of your space if I gave a description of the construction of the terrace, with the sizes of the columns, arches, &c., but I may say that it is constructed to bear a weight of twenty tons, and that a crowd of people have already been upon it without interfering with its stability in the slightest degree.—I am, &c.,

J. H. Huxtable, architect.

Park Lodge, Ilfracombe, July 18.

SCHOOL PLANNING COMPETITION.

Sir,—To the great majority of readers of the Building News, as to the writer, it is, doubtless, a matter of supreme indifference how schools may be erected down in romantic Cornwall. Nor would Mr. Trevail, of "Par Station," have had so much prominence but for the fact that when the discussion was initiated, his plan of a school was engraved in the same number. In parenthesis, I may remark that it is pleasing to see architects have at last found their way into Cornwall, especially in such remote districts as

Mr. Trevail hails from. It is a good sign of the growth of the profession and the circulation of the Building News. I can remember the time when architects *pur et simple* were scarcely ever heard of as residing in the west, except at Plymouth and Exeter. I have not forgotten, either, that one of the most successful competitors in the house planning competition practises in our remotest county. It is not for the edification of intending competitors that Mr. Trevail endeavours to reduce the important matter of lighting and ventilating schools to a personal quibble. Nor is it to be dismissed with such a flippant remark as "I might add further reasons, but time and space preclude my doing so." When, however, in the next breath he gratuitously insinuates the acceptance of a challenge (which was never given), he would afford opportunity for real test and examination, and satisfy our curiosity by giving naked facts and clear information, instead of shifting behind such vague generalisation as "the last schools completed from my designs" as a reference, which, indeed, is no reference at all, because, so far as we know, it may be across the big fishing-pond, or some such remote hemisphere. It is to be regretted that one should labour under the delusion that when the black-board is lit nothing more is required. Perhaps one-sixth of the whole time is given to it, so that in providing special light for that one article of use five-sixths of the entire vocations of the school are neglected. The question is, can you see to read, write, or draw best with light coming from the back, and is back-light the best of all, sufficiently diffused, and full? It is a matter which will arise again, for bare statements will not settle it. In this discussion we have referred to school buildings of one story. It is foreign to the purpose, therefore, to quote Mr. Robson, of the London School Board, whose buildings are several stories in height, and the circumstances altogether exceptional. I am of opinion that both top and side lights are the best when properly arranged, not only for light but for ventilation also. How beautifully the Royal Academy is lit by skylights. I will conclude with a quotation from Mr. Trevail: "One window" should be placed "opposite the children for through ventilation;" that would be in one wind a quick way of killing them, but for the purpose of complete and thorough ventilation, sublimely simple and inefficient, especially in open-timber roofs, for the upper part of the chamber would be always full of vitiated air. In choosing a referee to decide on the merits of the plans, it should, I think, be a point to select some architect who has not previously, either in competition or discussion, bound himself thereby to any class of design or to any fanciful hobby.—I am, &c.,

H.

STOCKTON EXCHANGE COMPETITION.

Sir,—The following is a copy of the instructions received on application for this competition. Would their publication not be the severest censure worth inflicting?—I am, &c., A. B. C.

[*Copy of Memo.*]

On the receipt of 10s. I can forward you a tracing showing the outline of the ground. The bank and post-office are intended to be the principal front of the buildings in High-street, and the hotel and club-rooms at the back facing West-row and the public exchange in an intermediate situation. The offices and cellarage are left for the consideration of the architect.

The Secretary
Stockton Exchange Company (Limited),
July 16, 1872. Stockton-on-Tees.

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PARLIAMENTARY NOTES.

Battersea Park.—Mr. Cowper-Temple asked the First Commissioner of Works whether it was intended to employ any portion of the land within the boundary fence of Battersea Park for purposes of building.—Mr. Ayrton knew nothing of any such proposal.—Sir R. Peel wished to know if the right hon. gentleman would not take some steps to finish Battersea Park, and take an additional vote in the estimates for that purpose. Mr. Ayrton said the estimates for the present year had been voted, but he thought it was desirable that the work in Battersea Park should go on, and he had therefore directed trees to be planted round the park, so as to hide the houses that might be built in the neighbourhood. He regretted very much that similar steps were not taken years ago by his right hon. friend Mr. Cowper-Temple (laughter).

The Thames Embankment Bill.—On going into committee on the Thames Embankment Bill, Mr. V. Harcourt moved that it was not expedient at this late period of the session to go on with the bill. After some discussion, the amendment was carried by a majority of 154 to 133; the bill was therefore lost.

Ecclesiastical Dilapidations Act (1871) Amendment Bill.—Lord Egerton, on Thursday week, in the House of Lords, in moving the second reading of this bill, said by the Act of last year clergymen were obliged to put their houses in perfect order before they could get a five years' certificate under the Act. The consequence was that numerous applications had been made to the governors of Queen Anne's Bounty for loans connected with matters which were called "tenant's repairs," and as it was obviously unfair that loans for such purposes should spread over a period of 31 years, and that incumbents should be called upon to defray charges incurred by their predecessors, the present measure was intended to remedy that state of things. The bill was read a second time.

Intercommunication.

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QUESTIONS.

[2612.]—**Book on Scaffolding.**—Can any reader tell me the title of a book on scaffolding in general, or of any book or pamphlet which describes the mode of erecting any particular building as regards scaffolding?—A. A. H.

[2613.]—**Roman Catholic Cathedrals.** — I should be glad if a subscriber would give a complete list of the Roman Catholic Cathedrals in England and Wales.—Anglo-Catholic.

[2614.]—**Properties of Building Materials.**—In trying to obtain some knowledge of the properties of building materials, I find that I cannot go very far without knowing something of chemistry. Would some one advise me how to proceed, and what books would benefit me most?—J. W. H.

[2615.]—**Room for Valuable Papers.**—Having to deal with a room for this use, which is supposed to be well ventilated and in good position, yet the papers show unmistakeable signs of dampness, I shall be favoured if any one will give a suggestion which may remedy the defect. The room is 12ft. square, hollow walls, on ground floor, one outside wall, other walls inside, one entrance door, which it is necessary to keep closed. There is an air flue from highest point running up with chimney-stack; it is heated in winter with warm air. There are two small ventilators in outer wall at highest point. The floor is 2in. flags laid on concrete, thoroughly dry. Ceiling is arched.—C. L.

REPLIES.

[2606.]—**Ornamental Brickwork.**—There is a new church (S. Andrew's) at Surbiton which is well worth the attention of "D. F." From what I can remember (I just went inside the door), there is no painted decoration (with the exception of the roof of an apse at the west end), and very little stone employed. I think the building is worth an illustration in the Building News.—Kingstonian.

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LEGAL INTELLIGENCE.

Singular Attempt to Reduce an Architect's Commission.—Oswald *v.* the Guardians of the Newcastle-upon-Tyne Union.—This case, tried before Mr. Justice Willes, at Newcastle, on the 15th inst., was for professional services rendered by the plaintiff, who is an architect in Newcastle, to the Guardians of the Newcastle-upon-Tyne Poor Law Union in the erection of an infirmary and alterations of the workhouse buildings. The amount claimed was £538 18s. 1d.; £150 had been paid into court; and the action was to recover the balance, £388 18s. 1d. The action was based on the following letters:—"North Elswick Hall, 23rd November, 1867. Sept. Oswald, Esq., Newcastle, Sir,—The Guardians of the Poor of this Union are about to build hospitals, &c., near the present workhouse. The plans are about ready, but the intention of the Guardians is to engage a professional man to do the following work:—1. To examine, and if necessary to alter or add to these plans, all of which are to be gone over with Mr. Brown and our medical officer. 2. To revise and alter the plans as required by the Guardians or the Poor Law Board. 3. To prepare estimates to submit to the Guardians on Friday next if possible, but at the latest on Friday week, the 6th December, 1867, when the plans are to be laid before the Guardians. 4. To superintend and carry out the whole of the works to completion; and 5. To do all and everything necessary to be done to commence, carry on, and finish the work. Great attention to be paid to warmage, light, and ventilation. If I succeed in inducing the Guardians to confer the appointment on you, will you undertake to work on the clear understanding that your remuneration is to be 2½ per cent. commission on the gross actual cost of the works, and no more? If I do not succeed in securing the appointment for you, then in that case I undertake to pay you £10 10s. (ten guineas) for doing the work Nos. 1, 2, and 3 on the other side. But, if the Guardians do confer on you the appointment, then in that case the ten guineas are to be considered as a part of the commission of 2½ per cent., and is to be deducted from the gross amount of the said commission. Please to say if you will undertake the work on the terms I have named.—Dear Sir, yours truly, Henry Milvain." To the letter Mr. Oswald replied that he accepted the conditions stated.—Mr. Septimus Oswald, the plaintiff, examined by Mr Bruce: I am an architect in Newcastle, and have been since 1855. On 23rd November, 1867, I had an interview with Mr. Milvain, vice-chairman of the Newcastle Board of Guardians. In consequence of that interview, I received a letter from Mr. Milvain, and replied on the same day. On the 25th November I first saw the plans; they were not at all matured; it was not possible to make an estimate from them. The Committee saw the deficiency of the plans for themselves. I received no written instructions from the Board as to how the plans were to be drawn. I received all my instructions from the Workhouse Committee, and they were all verbal. (The minutes of the Committee were put in). The plans shown to me made the building run north and south; mine made them run east and west; that change involved an entirely new plan. The plans I received were of no use whatever in the preparation of the plans I made. My plans were sent to the Poor Law Board, who returned them with certain requisitions, one of which was that the quadrangle should be open to the south instead of to the north. The ground falls from the south to the north to the extent of 14ft. The alterations required by the Poor Law Board necessitated a new set of plans. I went to London with a deputation from the Guardians to wait upon the Poor Law Board, to see what alterations were required; and on the 24th April the Board approved of a small pencil plan [produced] showing the buildings turned round. I afterwards made a new set of plans in accordance with that change—that is to say, working plans. I also prepared specifications and took out quantities for tenders. On the 8th of August, 1868, I received from the clerk to the Board of Guardians the following letter:—"I beg to inform you that at the meeting of the Board of Guardians of this Union held yesterday, you were appointed the architect to superintend and carry out the whole of the works of the above erections, at 2½ per cent. commission on the gross actual cost of the works, and no more, in conformity with the agreement made with the vice-chairman of the Board." The buildings were erected from my second set of plans, and I superintended. The usual charge for the preparations of plans and superintendence is 5 per cent. Assuming that there was no contract, the charge for the second set of plans, and an approximate estimate, would be 1¼ per cent. I charge 1¼ for the first set of plans. The preparation of the plans down to the commencement of the works is 2½ per cent.; the plans for the latter were complete with specifications.—Cross-examined by Mr. Holkar: The basement story at first was of necessity built; but the Guardians did not at first intend to complete it; they would leave the walls rough, and have very few windows and no plastering, and the 5 per cent. was commission on £771 14s. 2d. for completing the basement, while the 2½ per cent. on £12,604 was for superintending the works. A number of plans prepared by Mr. Brown were produced to me. One was a block plan.—By the Judge: This is a totally different plan to mine. This is for an enclosed yard; mine was for a quadrangle.—Cross-examination resumed: Mr. Brown's plan was for one long building. I had no plan laid before me from Mr. Brown for a quadrangle. Brown's plans were repudiated by the Guardians. I suggested a variety of alterations. I placed the quadrangle to the north by direction of the committee. I got written orders from the Guardians for which I charge extras. I never told the committee that I intended to make a charge for making the fresh plan until I found there was an impression that I was not to be paid. I told them before I sent in my bill. In a written statement produced to the committee on 1st July, 1870, as to the probable cost of the building, £700 was put down for the architect. The works were finished on the 20th July last year. I did not explain to the committee before April, 1868, that I was going to charge extra: it was a matter of course.—Re-examined by Mr. Herschel: Brown's block plan did not facilitate my plan for the buildings. Besides my interviews with the committee, I spoke to individual members. I got specifications with Brown's plan, but they were of no use to me.—Evidence in support of the plaintiff's case having been given by Mr. Matthew Thompson, President of the Northern Architectural Association, and by Mr. R. J. Johnson, F.R.I.B.A., of Newcastle, the case for the defendants was opened. On their behalf it was stated that the Guardians wished to have this work done at the smallest possible cost, and, wishing to utilise the plans made by one of the inmates of the house, Mr. Brown, who was a very good architect, they entered into an arrangement with Mr. Oswald; and they relied upon the contract contained in the letter of Mr. Milvain, and accepted by Mr. Oswald.—His lordship said he would not put any question to the jury upon the written contract. The defendants' counsel thought that the question would be, looking to the written contract, whether, when this work was done, there was an understanding that it was to be paid for. He thought Mr. Oswald was not entitled to anything; but, if entitled to anything beyond what had been paid into court, it would depend upon the amount of work under the contract.—Witnesses having been called for the defence the judge summed up, and the jury, after ten minutes' consultation, gave a verdict for the plaintiff, both as to the plans and specifications. Amount £200 out of the £246 claimed.

District Surveyors' Fees.—At Guildhall Police-court, on Friday last, Alderman Sir R. W. Carden gave judgment in a case materially affecting builders and district surveyors. (The case was reported in the Building News for June 7 last.) Some time ago Mr. Wigmore, a builder, built a number of arches under the foot-pavement in Paternoster-square, on part of the site of Newgate Market. The space formed a square, and round it were constructed fifty-two arches. Mr. Power, the district-surveyor, claimed 10s. for each arch, and

Mr. Wigmore offered to pay only one fee of 10s. for the whole of them. Sir R. W. Carden thought that they could not be called one building, but at the same time considered that the Act did not contemplate a fee of 10s. for each arch. Ultimately a case was granted, and it was argued in the full Court of Common Pleas, and the judges decided that the whole of the arches could not be considered one building, nor could they be looked upon as fifty-two separate buildings. The court, therefore, referred the matter back to Sir Robert, to ascertain how many buildings were to be placed on the ground, and to give a fee for each. Since the case was before Sir Robert on the former occasion there had been twelve houses commenced upon the ground, so that the question was settled beyond a doubt. He now made the order for the payment of twelve fees, each party to pay his own costs.

Our Office Table.

Technological Examinations.—Prince Arthur presided on Saturday at a conference, held at the rooms of the Society of Arts, upon technological examinations. The Lord Chancellor, Sir John Pakington, Dr. Playfair, and many others were present. Prince Arthur, after referring to the late Prince Consort's views on the subject, explained that the Society of Arts are endeavouring to encourage among those who are practically employed in various industries the study of art and its application, the society wishing to give certificates, prizes, and scholarships to those who show that to a practical knowledge and skill as workmen they have added an accurate knowledge of natural principles.

The Vendome Column.—Everything is now ready for the reconstruction of the column in the Place Vendôme, at Paris. The plans are all prepared, the expenses being calculated at 250,000f. and M. Normand, the architect, is only waiting for orders to commence operations. The fragments of the pillar are arranged in one of the rooms in the right wing of the Palace of Industry. Out of the seventy-six subjects depicted by Bergrot, two or three only have had to be reproduced; and the sculptures of Bosio, Callamart, and Clodion are intact. One only of the bronze bands, on which were the pictures in bas relief of the exploits in the campaign of 1805, was disgracefully damaged by the Federates, and will have to be entirely recast. As to the reconstruction, the plan will be followed which served for the first erection; and the staircase in the centre and the construction around it will be of stone and masonry.

Subway at S. Martin's-le-Grand.—The City Commissioners of Sewers have been informed by Mr. Ayrton that the Government are about to construct a tunnel under the roadway in S. Martin's-le-Grand, so as to form a means of communication between the two post-office buildings in that street, and that the Office of Works is prepared to pay the sum of £4,480, the estimated cost of diverting the sewers.

Royal Institute of British Architects.—The present session (1871-72) will terminate on the 26th of August next, and the first ordinary general meeting of the ensuing session (1872-73) will probably be held on Monday, the 4th of November, 1872. The Institute will be closed for a fortnight during the month of September. The sum of £45 4s. is still required to make up the balance due for the portraits of Professor Donaldson and Mr. Beresford Hope, M.P. In order that this debt may be discharged, members intending to subscribe, who have not yet communicated their intention to the honorary treasurer of the portrait fund, Mr. Charles C. Nelson, Fellow, are requested to assist his arrangements by forwarding their subscriptions to him before he leaves town at the close of the present month.

Sutcliffe's Syphon Traps.—Messrs. Wright, Sutcliffe, & Son, of Halifax, are manufacturing patent syphon and other bent pipes and sink pumps worth the attention of architects and builders. The syphon trap is cast of pure lead, locked together in the bends, and thus made as strong as a straight pipe. Their universal new shaped trap contains a very considerable flush of water, and is particularly adapted for hospitals, barracks, public buildings, and schools, where a longer flush of water is required. The patentees claim that it will contain at least three times the amount of water of any other trap made of equal diameter, and yet is not so liable to stop up, because the lines are on an incline, whereas in the ordinary syphon they are perpendicular.

Appointment of Building Tradesmen to the City of London.—At the last meeting of the Court of Common Council, the City Lands Committee recommended that the tenders of the following firms should be accepted for the works usually carried out by City tradesmen, viz.:—Plasterer and bricklayer, Messrs. Browne & Robinson; plumber, Joseph Taylor & Son; painter and glazier, Pitman & Cuthbertson; carpenter, Gammon & Son; smith, John Farrand Clarke; upholsterer, Cooper & Holt. The report was adopted.

The Architect's Office, Guildhall.—At the last meeting of the Court of Common Council, the Lord Mayor in the chair, the Officers' and Clerks' Committee reported on the reference of the 21st March relative to the Architect's Office, and recommended that Mr. Henry Carver be allowed to retire upon a pension of £200 per annum; also the following arrangement of salaries for the future staff:—Principal clerk (as at present), £400 minimum; £600 maximum; second assistant, £300 minimum, £400 maximum; third ditto, £200 minimum, £300 maximum; fourth and fifth ditto (together), £250 minimum, £400 maximum; office boy, £26 minimum, £60 maximum. The report was adopted.

Trade Festivities.—On Saturday week the *employes* of Messrs. Hayward & Son, decorators, of Newgate-street, had their fourteenth annual dinner at the Rye House, Mr. Easley in the chair, Mr. Cordery being vice-chairman.—On the same day the *employes* of Messrs. Farrow & Jackson, of Great Tower-street, celebrated their tenth annual "beanfeast" at Walton-on-Thames, when Mr. C. H. Farrow, the junior member of the firm, was present.—At the Queen's Arms, Hampton Court, on the same day, the men employed by Mr. D. Bostel, builder, of Golden-lane, had their annual dinner. Mr. R. Nash presided, and Mr. Bostel was present.—On the same day, at the Little White Hart, the workmen in the employ of Mrs. Pritchard, builder, of Warwick-lane, had their annual "beanfeast."—The *employés* of Mr. R. P. Tate, glass merchant, Holborn, held their annual dinner on the same day, at the Red Lion, Thames Ditton.—The annual dinner of the men employed by Messrs. L. Devereux & Son, plumbers, &c., of S. John's-street, Smithfield, and Stoke Newington, was held at the Red Lion, Hatfield, on Saturday week, the head of the firm, Mr. H. D. Devereux, in the chair.—On the same day, the annual excursion and "beanfeast" of the *employés* of the firm of W. & J. R. Hunter, cabinet-makers and upholsterers, took place at the Harrow Inn, Knockholt, Mr. John Hunter being present.

Death of Mr. Henry Tidey.—The death of Mr. Henry Tidey, a member of the Institute of Painters in Water Colours, and one of the chief promoters and a vice-president of the Society for the Encouragement of the Fine Arts, is recorded. Mr. Tidey has been for many years a contributor to the leading exhibitions in London and in the provinces. In the earlier part of his career he devoted himself principally to water-colour portraits, and was a regular exhibitor at the Royal Academy. Since his election as a member of the Institute, however, he has been engaged almost exclusively on subject pictures. Among his principal works were "The Feast of Roses;" "Dar-Thula," from Macpherson's "Ossian," in the possession of the Duke of Manchester; "Christ Blessing Little Children;" "The Woman of Samaria," and "The Night of the Betrayal;" "The Last of the Abencerrages," "Sardanapalus," "Hiawatha," and many other works. Mr. Tidey's most remarkable work, however, and one which attracted great attention the year it was exhibited, was "Queen Mab," taken from his favourite poet, Shelley.

Steam Rolling in the Repair of Roads.—In another part of to-day's impression we give the report of Mr. James Lovegrove, the surveyor for Hackney, on steam rolling. Mr. Lovegrove demonstrates the advantages which arise from this method of repairing roads. That it is better for the horses than the old system of grinding down the loose granite by the traffic is sufficiently evident, and that it is more convenient for the inhabitants and less costly to the ratepayers the report gives ample testimony, and so humanity and economy go hand in hand.

Society of Engineers.—Arrangements have been made for a visit of the members and associates of the Society to the locomotive works of the London, Chatham, and Dover Railway Company, at Longhedge, Wandsworth-road, on Friday next, the 26th inst. Members and associates to meet at the Longhedge Works, near the Wandsworth-road Station of the London Chatham, and Dover Railway, at 2 p.m. The trains leave Victoria Station at 1.22 and 1.37, and Ludgate Station at 1.7 and 1.22 for the Wandsworth-road. Members and associates to pay their own expenses, and may introduce friends.

CHIPS.

A new Free Methodist Chapel is about to be erected at South Somercotes. Three tenders were sent in to the trustees at Louth, the lowest of which, that of Mr. J. M. Thompson, was accepted on Wednesday week.

The Marquis of Westminster has informed the S. George's, Hanover-square, Vestry, that he proposes to lay out and plant the space now inclosed in Ebury-square as a public garden.

Mr. H. Haddon, architect, of Malvern, has been unanimously elected a member of the Local Board of that town, in the room of the late Sir H. Lambert, Bart.

The lower part of the walls of the chancel of S. Michael's Church, Handsworth, near Birmingham, have been elaborately painted, in order to make them harmonise with the reredos. The colours chiefly employed are of a neutral tint, relieved with gold. The ornamentation has been carried out under the superintendence of Mr. S. Bourne.

The Library Committee of the Corporation of London have accepted an offer made by the Clockmakers' Company to deposit their library and collection of ancient watches and watch movements in the new Library and Museum.

During the last twenty years more than £50,000 has been spent in the town of Eastbourne in public improvements, such as sewers, waterworks, paving, road-making, &c.

Mr. C. Stuart Barker has been unanimously elected chairman of the Building Act Committee of the Metropolitan Board of Works.

The Nonconformist Church Building Society, at their meeting on Monday week, made a grant towards the restoration of Hucknall Torkard Church.

It is stated that Mr. H. Cole, C.B., is about to resign his appointment at the South Kensington Museum.

Upon the recommendation of the Coal, Corn, and Finance Committee, the Court of Common Council has voted the sum of £1,300 for works in connection with the new City Library and Museum.

An hotel, named the Royal, has just been erected at the new watering-place of Clacton-on-Sea. It was opened on Wednesday last, the 24th inst.

A new church is being erected at Hoar Cross, near Yoxall, Burton-on-Trent, for the Hon. Mrs. Meynell Ingram, in memory of her late husband. It is being built by daywork, no builder being employed. Mr. G. F. Bodley is the architect, and the works are being carried out under the superintendence of Mr. J. Peed, clerk of the works.

A tar pathway was set on fire at Oxford the other day through the overflow of tar from a boiler. It was extinguished by throwing shovelfuls of sand upon it, but not before about 30 yards had caught fire.

A new Wesleyan Chapel was opened at Newchurch, Lancashire, on Thursday last. It is in the Italian style of architecture, and will seat from 600 to 700 persons. The cost will be about £2,400, which has been raised, with the exception of £600.

The fund for the rebuilding of S. Nicholas' Church, Dorking, has now attained sufficient dimensions to justify the commencement of the work.

The Canterbury Town Council have decided to invite tenders from persons desirous of taking the sewage and dust of the city off the hands of the corporation. From £200 to £300 annually has been expended by the city in experiments in sewage utilisation.

The old "drop" at the Suffolk County Gaol fell one day last week with a loud crash. The dilapidated condition of the gaol had been the subject of complaints at the recent Quarter Sessions.

The foundation stone of S. Edward's New Schools, Summerton, Oxon, was laid on Tuesday week. Mr. E. Wilkinson, of Oxford, is the architect, and Messrs. F. Orchard, Bros., Banbury, the builders.

It is proposed to form a new street in Preston leading from Back-lane to Friargate, opposite Lune-street, at an estimated cost of £15,000.

It is proposed to construct a new harbour at S. Petersburg, and to deepen the Neva.

New Wesleyan Day Schools were opened at Reigate on Monday last. Accommodation is provided for 295 children. Mr. Francis Brown was the builder.

On Wednesday the Bishop of Winchester consecrated the church of All Saints', Blenheim-grove, Rye-lane, Peckham. The building is a handsome one. The roof is of stained pine, as are also the pews. The style is Gothic. A neat school house is erected at a slight distance from the church.

It appears that large quantities of grease find their way into the sewers of Bermondsey. Seven years ago the Board of Works permitted its sewer men to explore the underground channels in the neighbourhood, and the result was the collection of grease or fat, which, when sold, and after paying liberally for expenses of collection, left a balance of £101.

Trade News.

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WAGES MOVEMENT.

BRISTOL.—The builders' labourers at Bristol have resolved to form a union. A meeting was held on Wednesday night in support of their claims to share in the general increase of wages throughout the country.

DUDLEY.—The limestone burners of Dudley and district are now on strike for a reduction of five hours per week and one-ninth of the stint. The men urge that they have not received a rise of 6d. per day for the last eight or nine months, and that if the masters concede their present demands they will then get far below what is due to them. Subscriptions are solicited on behalf of the men out on strike. A meeting in support of the limestone burners was held on Wednesday.

GLASGOW.—The strike of the Glasgow operative masons is now in its eighth week, and both parties still seem inclined to hold out. The demands of the men are that their wages should be increased to 7d. per hour, with weekly pays. At the commencement of the strike, the employers virtually, and some of them actually, conceded the 7d. per hour, but refused the weekly payments. At a meeting of the operatives on the 1st of June in the Trades' Hall, it was resolved to accept in the mean time the 7d. per hour, and defer the question of weekly pays until the beginning of September. This resolution was made known to the masters, who have not yet, however, sent any communication to the workmen. We are informed by the secretary of the latter that if the strike lasts much longer, assistance will be given to the men on strike by the operative engineers and shipbuilders on the Clyde. It is feared that should the dispute not soon be arranged the other portion of the building trade will be materially affected.

LONDON.—Affairs in London are pretty much in the same condition as they have been for two or three weeks past. The resolution which the master builders came to not to receive any more deputations has wisely been rescinded. At a general meeting of the "Central Association of Master Builders" held on Monday last, a letter from Mr. Shipton, the Secretary of the Amalgamated Builders' Trade Committee, was read. The following is the conclusion of the letter:—"The two chief objects to which I beg to direct your attention, because the others rest upon them, are—1st, the fact that the terms accepted by the masons do not give any security to us for the fundamental principle of the nine hours of labour; and 2nd, the entire absence of any guarantee to prevent the virtual abrogation of the nine hours by systematic overtime. Our object in seeking an interview with the Masters' Committee was to terminate the present contest for all trades as speedily as possible, and that nothing on our part should be wanting properly and honourably to effect the desired object." The reading of the above letter was followed bv a long discussion, which resulted in the honorary secretary being instructed to reply to Mr. Shipton's letter in the following terms:—"Sir,—Your letter of the 20th inst. was laid before the Committee of the Central Association of Master Builders this day, and I am requested to say, in reply, that the terms on which the shops and works in London have been reopened allow a reduction of the hours of labour to an average of 51 per week, and a rise in the wages from 8d. to 8½d. per hour, thus granting the greater portion of the demands made by the workmen in various memorials presented by them. Beyond these concessions the master builders are on no account prepared to go, and it is immaterial whether the utmost concession they are willing to yield were extracted from them by the masons or by the representatives of any other trades. The same concessions are open to the trades your committee represent, and if in the terms granted there are any which either do not apply to any particular trade, or which do not give equal advantages to all trades, my committee will be willing to appoint a deputation to discuss such points, provided they are defined in writing and previouly agreed upon." The above letter is indicative of a desire to negotiate, and on the same basis as suggested by the BUILDING NEWS from the first. If our advice were taken how much time, and temper, and money might have been saved! Fifty-one hours a week is nine hours for five days, and six hours for Saturday. The masters thus virtually concede to the nine hours' demand, but each working day throughout the year will not be exactly the same length. The length of the day will be determined by the season of the year. A meeting of the delegates of the men was held last evening to discuss the proposition of the masters, but we could not learn the result of the deliberations before we went to press.

MANCHESTER.—At an aggregate meeting of carpenters and joiners, held in Manchester on Tuesday night, it was resolved to assist the locked-out carpenters in London with a levy of sixpence per week per man.

MANCHESTER.—The following letter has been received by the Honorary Secretary of the Master Masons' Association from the secretary of the operatives:—"Sir, I am instructed to inform you that the operative masons of Manchester, Salford, and Hulme respectfully demand a reduction of the hours of labour from ten to nine hours per day the year round, and an advance of wages from 7½d. to 8d. per hour. You will much oblige by letting me know on or before Friday evening, the 19th inst., if this demand can be conceded, as the masons, in general meeting assembled, will on that date take decisive steps for its attainment.—I am, yours respectfully, John Clarke, Secretary." The time worked at present by the stonemasons of this city is 54½ hours per week for 37 weeks in summer, 47 hours per week in autumn and spring, and 41½ hours for six weeks in the depth of winter. Taking the year round it is about 51½ hours per week, or rather more than 8½ hours per day on the average. It would appear from their demand that they want a further reduction of five hours per week.

PRESTON.—STRIKE OF MASONS.—The relations between the masters and the whole of the men in the building trade at Preston are, according to a local paper, in a very critical state, and it depends upon the spirit which animates proceedings now in progress whether there is not soon open rupture in at least two of the branches. With regard to the masons, indeed, work has been generally abandoned pending the settlement of the points raised by the men; and it is reported that upon the result of this action the bricklayers will speedily move in the same direction. The precise extent of the demand on the part of the men is not openly stated, and the officials connected with the local society are reticent on the subject. Broadly given, however, the demand reaches to something like 6d. per day advance of wages, and there is added a somewhat complicated matter as to payment of mileage.

THE POTTERIES.—It is understood that the potters in the Staffordshire Potteries intend to press for an advance of wages at the next hiring (Martinmas) to the extent of from 20 to 50 per cent. No definite decision has yet been arrived at.

WALSALL.—On Friday night an aggregate meeting of lock and key smiths was held, upon the understanding that members of two out of the three firms with which the dispute is pending would attend and confer with the men. After waiting some time the meeting was informed that the employers could not attend that evening. After several addresses had been delivered, manifesting a determination to adhere to the list, a resolution was passed unanimously, expressive of deep regret that the employers had not met the men in conference, and of a determination on the part of the men engaged in the trade to adhere to the price list, together with an intimation that the Willenhall men should not be asked to give notice until the dispute with the Walsall men was settled; and a further intimation that if the employers, by any means, caused a breach of the agreement, the men would not return to work without a further advance of 10 per cent. Subsequently it was decided that, in the event of a conference with the employers, every branch of trade in each of the three shops should be represented by one delegate.

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Ashton & Green, Slate, Iron, and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

ASHINGTON (parish of Bothal, Northumberland).—For new mixed and infants' schools for 200 children, and residence. Stone, bricks, timber, and lime given by the Duke of Portland. All cartage provided by the tenants. Mr. F. R. Wilson, architect:—

Hogarth (accepted)	£698	8	3

BERKS.—For the erection of new (Roman) Catholic Schools at Abingdon, Berks, for the Rev. Dr. O'Toole. Mr. Edwin Dolby, architect. The following do not include fittings or bell:—

Drew	£655	0	0
Williams	590	0	0
Bryan	568	16	0
King	555	0	0

CUMBERLAND.—For the restoration and refitting of the parish church, Wetheral, Cumberland. Mr. Withers, architect:—

	Nave. £	Chancel. £	Tower. £
Orniston	926	344	317

FAREHAM.—For new farmhouse, buildings, and bullock shed at Albany Farm, on the Roche Court Estate, Fareham, Hants. Mr. Archibald H. Ford, architect. Quantities by Mr. C. W. E. Pines:—

	House. £	Farm buildings. £	Bullock shed. £	Total. £
Ward	1564	1710	305	3579
White & Son	1480	1687	320	3487
Light Bros.	1385	1600	245	3230
Knight	1312	1600	—	—
Cooper	1398	1508	249	3155
Fulford	1384	1463	215	3062

GREAT MISSENDEN.—For the erection of new range of stable buildings at "The Woodlands," Great Missenden, for J. E. McConnell, Esq., J.P. Mr. Arthur Vernon, architect. Quantities supplied.—

Ravell	£750	0	0
Taylor	720	0	0
Barghurst	675	0	0
Snell	625	10	0
Batchelor	617	10	0
Spicer	600	0	0
Fincher (accepted)	555	0	0
Clarke	550	0	0

HULL.—For fencing-in site of proposed Convalescent Home, Hessle-road, Hull. Mr. Withers, architect:—

Simpson & Malone	£488	10	0

LONDON.—For new studio and alterations at No. 43, Bloomsbury-square, for Bart Rous, Esq. Mr. Alfred Cross, architect:—

Perry & Sons	£1267
Bracher & Son	1235
Newman & Mann	1235
Clemence	1225
Howard	1221
Smith & Son	1127
Patman & Fotheringham (accepted)	1093

LONDON FORESTERS' ASYLUM.—For erecting four houses, being the first portion of the west wing of the London Foresters' Asylum, Bexley Heath, Kent. Mr. W. F. Potter, architect. Quantities prepared by Mr. C. R. Griffiths, surveyor, 7, William's-terrace, Chiswick, Middlesex:—

Beckett	£860	0	0
Vickery	855	0	0
Keal	846	0	0
Sabey & Son	822	0	0
Ashdown	784	15	6
Knight	720	0	0
Clark	678	15	9
Ellingham	665	0	0
Horne (accepted)	643	0	0

LONDON.—For rebuilding the "Bedford Head," Maiden-lane, for Mr. W. Lindsay. Mr. Alfred Cross, architect:—

Howard	£4400
Newman & Mann	4375
Wilson Brothers	4095
Patman & Fotheringham	3979
Colls & Son	3978
Perry & Son	3955
Hart	3784

LONDON.—For repairs, &c., at 11, Soho-square, for Dr. Farquhar Matheson. Mr. W. F. Potter, architect:—

Parks	£175
Perkins (accepted)	169

LONDON.—For photographic studio, &c., to house 11A, Berners-street, Oxford-street, for J. Werge, Esq. Mr. W. F. Potter, architect. Mr. T. Allen's estimate accepted.

ORWELL.—For residence for Mr. P. H. Meyer. Mr. E. Nash, architect:—

Bunting (accepted)	£2315

PRITLINGTON (parish of Bothal, Northumberland).—For new mixed and infants' school for 60 children, and residence. Stone, bricks, timber, and lime given by the Duke of Portland. All cartage provided by the tenants. Mr. F. R. Wilson, architect:—

Hogarth (accepted)	£478	16	6

RINGMER, SUSSEX.—For reseating and repairing the parish church, Ringmer, Sussex:—

Davey	£320	0	0
Thorp	299	0	0
Berry (accepted)	291	16	0
Miller	278	0	0

ROCKMOOR (Northumberland).—Accepted for additions to farmhouse, for the Rev. R. W. Bosanquet. Carriage supplied by the tenant farmer. Mr. F. R. Wilson, architect:—

Masons' Work.			
Sample	£237	0	0
Joiners' Work.			
Short & Son	265	0	0
Slater and Plasterers' Work.			
Fortune	79	7	8
Plumbers' and Smiths' Work.			
Thompson	65	10	0
Painters' and Glaziers' Work.			
Rennison	22	17	6

S. AUSTELL.—The S. Austell School Board met on Saturday (Mr. A. H. Veale in the chair), when the tenders submitted for the Central Schools were opened, and the result is given below. Accommodation to be provided for 500 children, with board-room, master's house, offices, &c. Mr. S. Trevail, Par Station, architect. In specifying, the works were divided, that they might be let either in one or in two contracts, with or without the master's house, at the option of the Board:—

Specifications No. I. and II. (comprising the whole of the works).

Matcham	£2464		
Matcham (if house was omitted)	1940		

Specification No. I. (comprising excavators', masons', bricklayers', slaters', and plasterers' work.

Ede	£1219	5	0
Ede, if house was omitted (accepted)	983	10	0

Specification No. II. (comprising carpenters', joiners', smiths', plumbers', glaziers', and painters' works.

Penrose	£1054	16	0
Penrose, if house was omitted	824	18	0
Paul	1045	0	0
Paul, if house was omitted (accepted)	820	0	0

SHEFFIELD.—For new offices for the Sheffield United Gaslight Company. M. E. Hadfield & Son, architects. Quantities by Mr. D. J. Brown:—

Neill	£29550
Shaftoe	29380
Longmire & Burge	27990
Dennett	26870
Carr	26455
Warburton	25000
J. & H. Chambers (accepted)	24375

WAVERTREE.—For the erection of new public offices for the Local Board of Health for the township of Wavertree. Mr. John E. Reeve, architect. Quantities supplied:—

Tomkinson	£3675	0	0
Gabbutt	3660	0	0
Fell, Parker, & Hunter	3656	0	0
Readdie	3650	0	0
Moore	3605	0	0
Burroughs & Sons	3565	0	0
Haigh & Co.	3546	0	0
Urmson	3500	0	0
Nicholson & Ayre	3479	0	0
Johnson	3449	0	0
Stananought	3427	0	0
Jones & Sons	3398	0	0
Okills & Morrison (accepted)	3361	15	0

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 2, 1872.

THE WORK OF THE SESSION.

THE season is over. Clients are flitting from town, and architects, with a sigh of relief, are looking forward to the enjoyment of a short period of relaxation, which they may as well take while others do. On the whole, they are rather thankful that as their workmen have struck, and the wages struggle been prolonged to this date, that it should now continue a time, in the hope that the settlement, when come to, will be permanent, since it cannot be called hasty. That the men, while cutting their own and their masters' throats, at a time when work is plentiful and living costly, by squandering half a season, should damage architects in proportion is annoying enough, but such is the fate of non-combatants in all wars, and as it seems the disputants will not learn by others' experience, it is best to allow their own to be thorough and self-convincing, at least for a good time to come. After all, some twinges of conscience must remind the profession that unseemly squabbles have not been quite banished from among their own august body, and that, notwithstanding the outwardly edifying spectacle of the harmonious Conference of Architects of 1872, it can hardly boast of perfect unanimity. How much clamour might have been spared, for instance, had it been foreseen how futile the attempt to oppose the nomination of Mr. Street and Mr. Burges to their respective works of the Law Courts and the decoration of S. Paul's would have proved. We trust that malcontents among ourselves will for the future bury their disapproval of the appointment of a professional brother in their own breasts. To avow it always bears the appearance of jealousy, and to do so without avail is excitive of ridicule. A retrospective glance at the work of the Session is not very exhilarating, and as usual the quiet workers have had the best of it. With few chances of doing great things, a steady quantity of good work is being done without ostentation through the the country, mixed with a quantity of trash, the authors of which make more noise in their day, but they and their works alike will be forgotten, while the other class of which we speak will leave enduring marks, as they are bricks of a substantial edifice of art, of which time alone will develope and distinguish the proportions. Of the transactions of the Institute and the Conference the least said is the soonest mended. Those that took part in them seem to have been mutually pleased with their efforts, and the results may be summed up in the conclusion that was generally arrived at upon the several points raised for discussion, to leave things for the present as they are.

Perhaps the most noticeable feature of the year has been the competitions set on foot by the London School Board, and to these it will be well to direct some attention. From the meagreness of the instructions issued it soon appeared that the Board, as the employers, were utterly without views, and had hit on the expedient of these competitions as means of getting a stock of ideas from the profession. According to the rule of the day, they saw no reason why they should not obtain this advantage at the least possible cost, and so, by giving out one school at a time to one batch of architects, and another at another time to another batch, and a third as a bone of contention to the multitude, they certainly obtained from that vast ill-compacted body of men who adopt the name of architects, and, therefore, constitute the profession, such as it is, a number of solutions to their problem. Why such a public body should demand such a task as that on an average six men should do the work for which they only offered payment to on is unaccountable, and, not to mince words, we will add unjust; and why the members of a profession should respond upon such terms is equally unaccountable, and we may add degrading. We may further say, and that upon authority, that had the invitation been met, as it should have been, with a courteous and reasonably explained negative on the part of a number of the leading architects invited, the system tentatively commenced would have been abandoned. Had the architectural press or the Institute approached the Board with a remonstrance against the project, such remonstrance would, in all probability, have had an effect. As it was, the Board had no intimation but that what they proposed and others had done before them was a just and wise course, and persisted in it. But the collapse of the system of competition thus instituted on such a scale, and by so public a body, may, perhaps, serve a good purpose in the end. The result has been, that for want of the power of conference between employers and architects the system entails, the problem of school planning even remains yet to be solved. Something has been gained on this point, but not much. As it is, not a single one of the designs chosen by this miserable hap-hazard system is thoroughly satisfactory, even from a practical point of view, while of architecture scarcely one deserves the name. Some of the leading men in the profession have had their designs returned upon their hands, and those of inferior and comparatively unknown men have been preferred, simply because by mere luck some arrangement not hinted at in the instructions met with favour. Certainly it would be a farce to say that competition in these cases has put the saddles upon the right horses, or brought to the front the ablest men.

But the most significant fact is that Mr. Reed, M.P., in his motion just carried at the Board, has let the cat out of the bag. Mr. Robson, the architect of the Board, is to be employed at a higher salary to design in future all the schools to be built by them. Thus is blazoned in the face of day the motive which many may have thought, but none dared to hint, lay from the first at the bottom of these competitions. The profession, it must be owned, has been used as a cat's-paw, to give to the Board, at the price of a few commissions scrambled among them, the knowledge of how to do without them, and get out of a salaried officer the work that at the proper professional rate of charges would cost them many times as much. Will some similar scheme be next tried to get the bricks and mortar, as well as the brains, at less than the market price? And when the schools are built will the masters' and mistresses' salaries be arrived at by a like system, and are such the principles of political and social economy which are to be inculcated into the rising generation?

We grieve while we write on the subject, for what might not have been made of this lost opportunity? Could not the problem have been better worked out by the distribution of the preliminary competitions among some architects of established fame, who, after conference with the Board and their architect, might have submitted sketches, and altered them again and again until perfect? Had such a course been taken, we fancy the Board would have arrived at a better opinion of architects than they seem to have. They would have found their work as well worth paying for as the bricks, and not overpaid at a percentage, which, no doubt, many of the members of the Board earn in as many minutes as architects do in months. As it is, the Board have little to thank architects for, for they have not gone the right way to get what they wanted out of them; and architects have little to thank the Board for, for collectively they have been made to spend probably ten times the value of the commissions to be paid out[*] to a few of them; and now it is proposed to throw them aside like a squeezed orange, and to get their work done at a salary which would amount to about a tithe of the commission they ought to pay for the work. In any way, the experience recounted will have been one worth reflecting upon, and must have considerable results for the future.

Another large competition, that of Mr. Holloway's for the S. Ann's Heath lunatic asylum, deserves notice as having been put upon a different and more liberal ground, far more nearly approaching the terms upon which alone architects should be content to compete at all. In this case ten moderate premiums were offered among fifteen competitors, and this proportion so nearly approached the ideal of a payment to each for his work, that it is only to be regretted that the number of premiums was not increased, or of competitors decreased, until they corresponded precisely. Practically, we believe they did correspond as regards those whom Mr. Holloway considered he invited himself. The results are said to have been commensurate, and the designs well thought out, and far above the average.

THE COMPETITION DESIGNS FOR PROPOSED LUNATIC ASYLUM AT S. ANN'S HEATH.

THE drawings sent in in this competition (referred to in our number last week, page 68) represent an enormous amount of mental and artistic labour. Although the proposed building is of considerable magnitude, the cost being estimated at £40,000, the drawings, if valued at £10 each, would represent the value of the architect's commission on the works. The competitors may be divided into three classes—viz., those who have studied the plan to the neglect of the elevations; those who have studied the elevations to the neglect of the plan; and those who have given a moiety of study to each. Unfortunately, the best plans are not accompanied by the best elevations, and the best elevations are not accompanied by the best plans. With regard to the plans alone, there is much that is new, and much that is good; but as a rule what is good is not new, and what is new is not good. With the elevations, on the other hand, we have both qualities combined. Of the various forms of existing asylum buildings, three are here represented: the block and corridor plan, the pavilion plan, and the house plan; and two are not represented—viz., the cottage plan and the mixed plan. Although most of the designs show considerable care and ability in planning, there is not one of them which shows an extensive, practical acquaintance with asylum buildings. If there is one thing that genius cannot do, it is the designing of a good plan for a lunatic asylum. It is solely a question of ascertaining what has been done, and finding out how much of what has been done is suitable, and how much unsuitable, and then, by hard labour, working out a plan from the knowledge thus gained. Now for the designs, and we will begin with the one to which the first premium has been awarded, viz.:—

"ALPHA."—This is a specimen of the block and corridor plan. In outline, it is similar to some existing buildings of the class. The north block, in which, of course, is the entrance, contains the medical officer's apartments, reception room, visitors' rooms, and the usual rooms to be found in that part of an asylum; behind are the kitchen department and stores in a one-story building. Two parallel corridors on each side of this building connect the north and south blocks, in what may now be called the usual way. The south block, which is the largest, has in the centre a large recreation and dining hall, with the first and second class male patients on the one side, and the first and second class female patients on the other side. At each end of this block is a wing of L form, containing the wards for sick patients, and the wards for the excited or acute cases; the latter being connected directly with the north block by covered ways. On the east side of the north, or entrance block, but detached from it, is the laundry and wash-house, &c., with the gasworks attached thereto. The workshops and stores are arranged in a row adjoining the covered way from the north block to the wings. So far, the plan is based on good existing models, but, in detail, it is very different. Usually, a wide corridor, with projecting bays, occupies the front part of the south block, with the single rooms to the back entering from this corridor, which is, in fact, a gallery day-room, and one of the most cheerful rooms in an asylum, and often allotted to the more acute cases. The author of "Alpha" has put his corridor—which, indeed, is reduced to a 7ft. passage—to the back, with the single rooms to the front. The entrance doors from the airing grounds to the several wards open direct into the day-rooms, an arrangement which the designer would have avoided if he knew how cold an insane person is even in warm weather. This plan, like many of the others, wants a large steward's store, and also a scullery adjoining each day-room. Two elevations are given for this plan, one of a Tudor character, and the other of a more modern Gothic character, the material in each case being of red brick and stone. There is accommodation provided for 275 patients, at a cost of £40,000.

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[*] It would be instructive if the cost of these competitions to the profession could be approximately calculated.

The design, under the motto "Improbus labor omnia vincit," to which the second premium has been awarded, is in plan two quadrangles joined; the buildings extending round the four sides of the square. The administration department occupies the block separating the two enclosed quadrangles. It has been generally understood that the Commissioners in Lunacy strongly object to any plan of this description, their idea being that any quadrangle or court surrounded by buildings is a bad plan for getting a fresh circulation of air around the building. Corridors with projecting bays extend round the entire block on the side next the quadrangles, the rooms being to the outside. The dining and recreation hall adjoins the kitchen in the middle block, and the laundry is also in a convenient position attached to this block, but entirely blocking up the quadrangle on the female side. The elevations are a kind of Pointed Gothic, with traceried windows.

"Quadrant" is a semicircle plan, with an entrance block at the centre from which the buildings are struck, and the whole are conveniently connected by covered ways. This plan has never yet been carried out, although it has been tried in sketches before, and if properly worked out in detail would be the best plan of the lot, and perhaps one of the best asylums that has been built; but unfortunately, the details of the plan are imperfect, and show a total want of acquaintance with what has been done, and with what is required for a lunatic asylum. One of the principal defects is the centre passage on the upper floors with rooms on each side. an arrangement which the Lunacy Commissioners would never allow. The administration department is too small, to every day-room there should be a scullery about 12ft. square, and there are objectionable recesses in the corridors, where the patients would get out of the attendants' sight and work mischief. Notwithstanding these defects, the principle of the plan is excellent, and if thoroughly overhauled by one experienced in the requirements of an asylum, could be made the best plan of the thirteen submitted. The elevation is exceedingly good. The walls are of red brick, with square mullioned windows. A little bit of the top story is half-timbered, connecting high and picturesque dormers, also of half timber construction. The whole is simple, and suitable for its purpose, and as far as the elevations go, if the design was carried out, it would be one of the most picturesque asylums in England

"Progress" is the most ambitious design (as far as the elevations go) of all; in fact, it is too much for the purpose. The drawings, which are got up in an effective manner, show the design to advantage. The plan is the only one arranged on the "house form." Each class is entirely separate, having on the ground floor dining-room, billiard-room or drawing-room, and morning-room, all entering from a hall, and the sleeping-rooms on the upper floors, the arrangement being just like a house, and the whole a row of separate houses, each having its own bathroom, pantry, &c., the whole being connected with the administration department by a covered way behind the building, from which a small branch leads to each ward or house. The kitchen department is properly placed in the centre, and the superintendent's house is well placed at the north-west corner of the entrance block, but it wants a covered way to connect it more directly with the main building. The laundry and workshops are both on the same side (the female), an arrangement that is not usually done.

"Choose the Best, &c."—This plan is arranged in a form designed a few years ago by the medical superintendent of a large asylum in the midland counties. The south block steps back in regular form on each side from the centre, so that the angles of each block would touch the circumference of a semicircle as near as may be. The north, or entrance block is planned in correct style, with double service corridors from same to the south block; in fact, the whole plan in its system is very much like a regulation plan of the Lunacy Commissioners, and the infirmary is well isolated. An incline cart road on each side of the entrance in the north front, for the delivery of stores into the centre of the administration block without having to pass through any of the covered ways, is a good feature. The medical officers' house, in a projection in the centre of the south front, with the large hall over the house, is thoroughly wrong. Many parts of the building have central corridors with rooms on each side, which is also a mistake, but the corridors, as a rule, have windows in the end, which is rather an important point with the Lunacy Commissioners, which "Alpha" and others have not attended to. The laundry and washhouse are too small for their work.

"Vivere sat Vincere."—The author of this design shows an acquaintance with the details of a lunatic asylum beyond the other competitors. The design is set forth in an elaborate and careful set of drawings. There is a north block for the administration department, with the kitchen department behind; the south block contains the first and second class patients, with wings at each end for the sick and feeble and excited patients, the former on the ground floor, and the excited patients over them on the first floor, which is not a good arrangement. The corridors, as in "Alpha," are to the back, and the rooms to the front. For the main part of the building—that is, the south block and wings—there are, besides a large central staircase, only two others, viz., at the junction of the south block with the wings. Another staircase on each side would have been an improvement. The large scale plans show a good system of heating and ventilation, with the flues from the single rooms, and the doors to these rooms opening outwards, as they should be, all carefully indicated. The laundry in a detached building seems unfortunately placed to the south-west of the south block. The elevations of brick and Portland stone are described as being "in the style of the Geometric period of Gothic," and are set forth in a careful but rather spotted-looking coloured drawing.

"Con Amore" takes its place amongst the best plans. The general block of the building is somewhat similar to the first premiated plan. This is one of the exceptional plans, in respect of having the corridor of the south block to the front, with the single rooms to the back, but the corridor (7ft. wide) is far too narrow; if made double the width, with a few bay windows in it, it would have formed a gallery that would have been the most cheerful day-room in the building. The large hall is well placed in the centre of the south front, with a bold circular bay window in the end. The north block and kitchen department are arranged in the usual way, and the detail of the administration department in the centre is carefully worked out, but the gasometer in a court on the female side is badly placed. This design would have been more favourably represented without the coloured drawing. The stable building is picturesque, and more skilfully designed than the elevation of the asylum building.

"Mens Sana in Corpore Sano."—In plan this design is arranged on the same system as the last, but it is more open than any of the other plans, and would cover nearly double the ground of some of the others. The corridor in this plan is also to the front of the south block, and it is 12ft. wide. A cloister for sunshade is formed round the recreation hall, which is in the centre of the south block. This plan is exceptional in having a scullery adjoining each of the day-rooms, which is indispensable. The infirm wards adjoining the recreation hall on each side are badly placed. The elevations are much inferior to the plans, and the coloured perspective drawing makes them look much more stareing than they would do in reality.

"Mens."—The elevations of this design are treated in a clever and artistic manner The centre block, with a bold and picturesque tower rising out of the centre, reminds one of the Congleton and Northampton Town Halls. The whole is spirited and effective, without being elaborate. The plan shows that the designer has not studied the requirements of a lunatic asylum.

"Au Bon Joueur Vient la Balle" is planned on the block system in an E form. The medical officer's residence is detached on the south front, and connected with the main building by a covered way. The laundry department is peculiarly placed in the front and side of the entrance in an L block. The plan would be improved by a covered way of communication from the north block to the wings.

"Economy through Concentration" is the only representative of the pavilion plan. There are three blocks on each side, with their axis east and west, connected by a block having its axis north and south, the whole forming two E's, with the administration block between them. There is an octagonal detached building on each side of the north entrance, one being the laundry department, and the other the stable, &c. Two of the pavilion blocks have a central passage on the first floor, with rooms on each side, and the superintendent's house is in the centre of the south block. The elevations are simple and asylum-like.

"Sanitas" is a long south block, with the superintendent's house in the centre, detached, and wings at each end for the sick and excited patients. There are large day-rooms along the south front, with attendants' rooms opening out of same to the back. The entrance block is arranged in an uncommon and rather original manner; it is a block with its axis at right angles to the south block, and faces west, with a corridor along the east side of the block connecting with the south building. The kitchen department, laundry, wash-house, &c., are arranged around a quadrangle at the back of the entrance block. The recreation hall is detached and connected with the corridors of the main building by a covered way.

Unless the Commissioners in Lunacy have changed their mind to a considerable extent within the last few months, not one of the designs will, in all probability, receive their sanction without alteration. W. Y.

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RAILWAY WORKS AT LONGHEDGE.

THERE is probably not one person out of a hundred who has travelled by rail from Vauxhall Station to Clapham Junction who has failed to observe the circular building on the down line side, which can be identified at once as an engine-house, in spite of the somewhat unusual manner in which it is planned, and in which the accommodation for its occupants is arranged. This building belongs to the London, Chatham, and Dover Railway Company, and constitutes a portion of their extensive works at Longhedge, Wandsworth. To visit these was the object of a party on Friday last, who assembled towards 2 p.m. in the vicinity of the Wandsworth-road Station. The party was composed principally of members and associates of the Society of Engineers, supplemented as usual by several visitors. After a courteous reception by Mr. Walker, one of the professional officials of the Company, the party proceeded to fulfil the object of their visit. Passing through the grinding-room, where grindstones 7ft. in diameter were rapidly revolving, and reducing to the required dimensions numerous link and motion bars, the fitting shop was entered. This apartment measures 200ft. by 50ft., and is in every way well adapted for the work that is carried on within its walls. As a rule the Company, like many others, do not make their own engines. At present, however, there are, to use a nautical term, four "on the stocks" in various stages of progress. When the driving wheels exceed 5ft. 6in. the resources of the workshop are not adequate to their manufacture, and they are obtained from one or other of the well-known locomotive firms in the Midland district. At present the London, Chatham, and Dover Railway Company are engaged in making some experiments with white metal instead of brass in those parts of their engines exposed to great and frequent friction. The result so far is in favour of the former material, the relative durability of the two being as 3 to 2. In the fitting shop were the usual variety of large machines for the purposes of facing, planing, drilling, slotting, and torturing iron in every manner known to practical engineers. The "Jim Crow" machine, which is Whitworth's patent, was new to some of the visitors. It may be mentioned here that in the ordinary cutting and facing machines, the back stroke, so to call it, is lost, as the cutter has only one edge, and can evidently cut only in one—that is, the forward—direction. But with a "Jim Crow" a cut is obtained both ways. On arriving at the end of the forward stroke, the cutter "jumps" round, and presents its edge in the direction of the back stroke, and cuts as it goes back. In spite of the ingenuity of this arrangement, it does not answer for heavy work. The two cuts are not uniform, and the gain by utilising the back stroke is not so much as might be at first imagined.

A good deal of interest was manifested in the turning of the balls for the valves. These are of gun-metal, and must be turned truly cylindrical. The fulfilment of this condition depends in great measure upon the manipulatory skill of the workman. It is true that the absence of all tool marks upon the ball, when it has reached a completely, or nearly completely, cylindrical condition, is some test of the accuracy of its shape, but it is not actually tested until it is fitted in the valve and submitted to the action of the steam. It is not difficult to understand that a workman of average intelligence would, after a certain amount of experience, become nearly as good a judge of the accurate shape of a ball as the practical test itself. In the wheel shop, which was next visited, the party witnessed the turning of the wheels intended for the new engines. The wheel lathes are 7ft. 6in. in diameter. Some of them are from the establishment of Whitworth, and others from that of Steuart. Those from the latter manufactory appear to be superior, as they are strengthened by ribs or radial stiffening bars, which are wanted in the machines manufactured at the former premises. The tyres of the engine wheels are of Vickers's steel. They are not bolted on in any way, but are simply shrunk on. There is a groove on one side of the wheel into which they fit, and on the other side they are secured by a concentric ring, which is driven on, and, as it were, keys the whole tyre in. The putting on and taking off the wheels from the axle is one of the heaviest operations in connection with the construction of an engine. The axle is driven on to the wheels by hydraulic power, and further secured by steel keys. Great as is the power that is required for this operation, it falls far short of that needed to get the wheels off again. In that case, the wheels and keys as well have to be pulled off the shaft. It will afford some idea of the pressure required when we mention that two of the iron barrels of the hydraulic pumping machine gave way under the strain, and that a steel one is now used to effect the desired purpose. In the smithy or forge, the steam hammer was at work forging a connecting-rod. The hammer can give a blow equal to about four tons in weight, although the actual weight of the hammer head itself is not much over twenty-five hundredweight. The usual amount of bolt making, and forging of various pieces of iron intended to form some component part of an engine, was being actively carried on, and furnished sufficient evidence that the ordinary repairs of so large a rolling stock as that possessed by the Company must suffice for the constant employment of a large number of working men and skilled artisans.

The principal object of attraction in the carriage shed was, naturally enough, the royal saloon carriage. The shed is about 250ft. by 120ft., and exceedingly well planned and ventilated. In winter it can be heated by hot-water pipes, not merely for the comfort and convenience of the workmen engaged in it, but also for the purpose of drying the paint and varnish on the newly-made carriages. Teak is the principal timber used in the construction of the carriages, and opportunities were afforded to the visitors of inspecting the actual building of the different classes of vehicles. The lower frame or bed is composed partly of timber and partly of iron, the framework being solidly fastened together by angle irons and knees. Adjoining the carriage-room is that appropriated to the preparation of the wood to be subsequently used in construction. Here are circular and ribbon saws, the former used for large baulks, 18in. square, and the latter for tenoning and mortising, as well as for sawing planks and battens. The building provided for the repairing of the engines is arranged in rather a peculiar manner, and consists of two long parallel workshops divided by a central space in which a traversing platform works. This platform is moved by steam, and serves to convey the engines backwards and forwards from one shop to the other. As may be imagined, these repairing shops are always pretty full of engines in every stage of progress. At the time of our visit one—the "Pyramus"—was resplendent in a new coat of paint, and evidently just ready to take to the road again. Others were without their wheels, and others were having their boilers cut in half and lengthened, while others, again, by the hollow noise proceeding from their cavernous interior were evidently being subjected to severe mechanical operations. As usual, the greatest amount of noise was experienced in the boiler-shop, where rivetting constitutes the principal feature of labour.

The party, after visiting the weighing-room, left the works well pleased and instructed at all they witnessed, not forgetting to thank very cordially Mr. Walker, who accompanied them throughout their tour of inspection.

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NOTES ON EARTHWORK.—XII.

WE have spoken of removing earth by waggons holding several cubic yards, and tipping them into railway embankments. There are other embankments, however, in the construction of which such waggons are not suitable; they are only suitable, indeed, for those banks which can be raised in one or at the most two heights, and where the rails consequently need only lengthening from time to time, and where it is not necessary often to take up and relay the road. When reservoirs are made by forming embankments across valleys, and damming up streams of water, these embankments are generally higher than railway embankments, although not so long. A railway bank consists of one homogeneous mass; but a reservoir bank consists essentially of three distinct parts—viz., a centre core of puddled clay, of sufficient thickness to prevent water passing through it, and an outer and an inner bank of earth to hold it up in its place. The slope of the outer bank may be any one at which the earth will stand safely without slipping, and is generally 2 horizontal to 1 vertical, the top width being only a few feet outside the puddle wall. The top width of the inner bank may likewise be only a few feet inside the puddle wall, but the slope must be regulated by the consideration that water will penetrate it; and when water has penetrated it, and the head of water in the reservoir is lowered, that water which had entered the earth does not usually escape from it so quickly as the water is lowered, and, therefore, tends to cause the saturated earth to slip. To counteract this tendency to slip, the slope is made flatter than the outer slope, generally 3 horizontal to 1 vertical.

The ground upon which a reservoir is constructed is seldom, if ever, sufficiently retentive down to a sufficient depth to allow of the core of clay puddle being carried up from the surface of the ground. The great pressure of a high head of water drives it into the pores of the ground, and, unless the centre puddle were carried down to retentive ground at a sufficient depth, the water would escape horizontally under it, and come out in the form of springs lower down the valley. For this reason a trench is excavated in the centre line of the embankment down to retentive ground, often 20ft. or 30ft., sometimes 40ft., and in a few instances the depth has been as much as 60ft.

The width of the trench at the surface of the ground is proportioned to the height to which the puddle wall is to be carried. The thickness of the puddle wall at the top should never be less than 6ft. when the clay is of the very best quality, and when the clay contains any mixture of other earth the thickness at the top should not be less than 8ft. Whatever the thickness at the top may be, which is uniform from end to end of the bank, one-sixth of the height of the bank above the surface at every point should be added to this top thickness, say 8ft., and that will give the proper width of the trench at every point. This allows a batter of 1in. in a foot on each side of the puddle-wall.

The top soil and all soft ground is removed from the seat of the bank and reserved for soiling the outer slope, no part of it being put into the bank itself.

It is sometimes necessary that the puddle trench shall be carried down to a greater depth than that originally intended. Trial shafts are usually sunk at several points along the intended trench, and from the appearance of the ground at these points the depth is estimated; but, nevertheless, when the whole length comes to be excavated there may be reasons for continuing the trench farther down. The timbering, therefore, should be so arranged, and be of such a strength, as to allow this to be done if necessary. Another reason for great strength of timbering is that it is important to prevent cracks taking place in the ground adjoining the trench by the giving way of the timbering, besides the importance in a money point of view by having to re-excavate the trench. There are two ways of filling in the trench with puddle. Sometimes the clay is thrown in in lumps in its raw state, and cut and cross-cut with tools and trodden in the trench, with the help of water. In this manner of working, the raw clay is spread along the trench in uniform and level layers of 6in. in thickness or thereabouts, and each layer is worked into puddle of the proper consistency before another is thrown in. Puddling tools are similar to grafting tools, described in a former number of these notes. The manner of working up the clay into puddle is by pressing down the tool with the foot through the top layer of clay and several inches into the one under it, in regular lines 2in. or 3in. apart, swaying the tool backwards and forward, and using sufficient water to soak the clay. This having been done longitudinally, the same layer is cross-cut in a similar manner, and the close treading of the workmen during the two operations puddles the clay into an impervious mass. Time is required for the raw clay to soak up water before the cutting is begun, otherwise the puddle will be liable to the presence of dry lumps, and will probably not be water-tight; at the same time, it is equally important not to use too much water. It is with puddling as it is with most other things—persistent labour is the quality necessary to success, and it is a mistake to think of shirking the labour by substituting water.

Another way is to puddle the clay at the place from which it comes, throw it into the trench, and ram it down with wooden beaters in layers of 6in. thickness. The lowest parts of the trench should be filled in first, and no part of the puddling should be carried up to a height of more than 6ft. above an adjoining part.

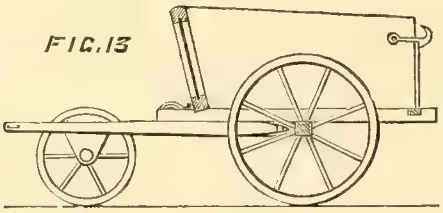
In the last number of a series of Notes on Carpentry, which we published some time ago, we said, with reference to cofferdams, that the business of the carpenter is to prepare a shell, or framework, of timber to contain and protect the clay puddle with which it is filled, to keep out the water, and that if we should thereafter have anything to say about earthwork we would describe the process of puddling. The above described method of filling the puddle trench of an embankment fulfils that promise, for the process is the same in both.

In filling the puddle trench of an embankment, it is important to prevent stones or earth falling into it while the puddling is proceeding. Sometimes it has been supposed that a mixture of gravel or small stones with the clay is not detrimental, and even that it is beneficial, but we confess to an inability to see any sound reason in this, and much prefer that the clay shall be clay only, for, besides the greater labour required to work puddle containing gravel, the mass cannot be so homogeneous, and, therefore, not so effectual in resisting the passage of water, as clay alone; and we imagine the mistake to have arisen from the fact that a mixture of gravel or small stones with puddle that is to be built upon strengthens its power of resistance to weight, and is, therefore, proper for such situations.

The sets of timbers should be withdrawn gradually, and after one set has been withdrawn the puddling should be continued right up to the next set of timbering before it is struck. Puddling cannot be proceeded with in frost, to make sound work, but after the frost is thoroughly out of the clay the effect upon it will have been so beneficial in breaking it up and mellowing it that it will require much less labour to complete the process. One man can fill into a puddle trench as much clay as five men can puddle—that is, as one can spread, and four can cut and tread; so that if a man fills in sixteen cubic yards a day and the wages average 3s. a day all round, the labour of puddling is worth 1s. 2d. per cubic yard.

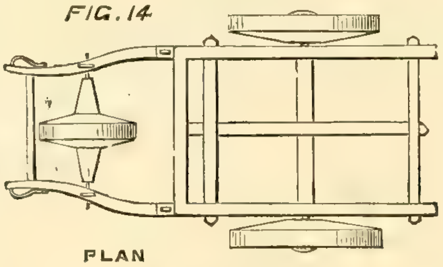
Before the lower and central part of the trench has been filled in with puddle to the surface for some distance on each side of the stream, the bank will have been raised to some height along the outer edge, or towards the foot of the slope, on the inner and outer sides. In order to consolidate the bank as it progresses, and not to leave that operation merely to the lapse of time, which in a reservoir bank would be dangerous, it is raised in thin layers, evenly spread one over another, and each layer well consolidated before another is deposited on it. How to accomplish this consolidation in the best manner is one of the chief problems the engineer has to solve. It has been strongly insisted on that these layers should never exceed 9in. in thickness, and that the earth should be removed and deposited in bank with barrows or with dobbin carts (and never with large waggons on rails, as has been sometimes done, and the earth tipped in layers of 6ft. or more in depth), and that each layer should be well punned with punners weighing not less than 10lb. weight, one punner being employed, besides one man to level down, for every man engaged in filling the barrows or dobbin carts; for one man can fill quite as much earth in a day as another can properly consolidate by punning. The dobbin cart is represented in Figs. 13, 14, and 15. It holds about three-quarters of a cubic yard.

FIG. 13



SECTION

FIG. 14



PLAN

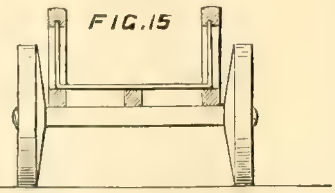


FIG. 15

CROSS SECTION

Independently of the practice, which varies in England, it may be worth while to consider the *rationale* of the position. The most perfect method of depositing earth in embankments in respect of thorough consolidation is probably that adopted by the natives of India, of carrying small quantities of clayey earth in baskets on their heads and depositing it evenly over the surface. In this manner the minimum quantity of earth receives the maximum amount of consolidation, for the consolidation is as the weight passing over it, and inversely as the quantity deposited by the instrument of its carriage (neglecting for the present the effect of punning). Taking a native workman to weigh at the least 100lb., and to carry 50lb. weight of earth, the ratio of the weight of the carrying instrument and the earth carried is 2·5 to 1 going and 2 to 1 returning, or a mean of 2·25 to 1. Now, if we say that the 50lb. weight of earth is spread over a space of 2 square feet, the thickness of it would be about 3in., and if we take for comparison with the other systems a height in each case of 10ft. we shall have in this (Indian) system the proportionate weight of $2\frac{1}{4}$ to 1 repeated 40 times in that height, and $2\frac{1}{4} \times 40 = 100$ resultant.

If we take barrow work, and say that an English navvy weighs 160lb., and his barrow 60lb., and that he wheels 220lb. weight of earth, the ratio of the weight of the transporting instrument to the weight transported is as 2 to 1 going, and 1 to 1 returning, or a mean of 1·5 to 1. If the thickness of the layers be 9in., there will be 13 of them in 10ft. in height, and $1{\cdot}5 \times 13 = 20$ resultant, as compared 100 in the other case.

If we take dobbin carts holding a weight of 2,000lb. of earth and weighing 800lb., and the horse 1,200lb., we have a ratio of 4,000 to 2,000, or 2 to 1 going, and 2,000 to 2,000 or 1 to 1 returning, the mean of which is 1·5 to 1. Taking the same thickness of 9in., the resultant is $1{\cdot}5 \times 13 = 20$.

If we take waggons holding $1\frac{1}{2}$ cubic yard, or say 4,000lb. weight of earth, and weighing 1,800lb., and the horse 1,000lb. as before (a horse taking one waggon at a time across the bank), we have a proportion of 7,000 to 4,000, or 1·75 to 1 going, and 3,000 to 4,000, or ·75 to 1 returning, the mean being 1·25 to 1. But it would never do to employ waggons and rails for layers of only 9in. thick; the road would require shifting too often; so let the depth of the layers be increased to $2\frac{1}{2}$ft.; there would then be 4 layers in the height of 10ft. The resultant, therefore, would be $1{\cdot}25 \times 4 = 5$.

These statements pretend to do no more than compare upon the same basis the different ways of raising a bank in respect of its consolidation *pari passu* with its rising. They take no account of the cost of any system, for it would be manifestly impossible to compare the money value of the labour of raising a bank in India with that of raising a similar bank in England; and further, they leave out the question of punning as a means of consolidation in addition to the consolidation ensuing from the traffic. One of the chief problems to be solved by the engineer, as we said before, is how to procure a thorough consolidation of the bank in the best manner, and in all these questions of how best to do anything the cost of it forms a material consideration. The most expensive may not always be the best, and it is certain that the cheapest is very often the worst. Take, for instance, the cheapest and least efficient of the cases above given, that of raising a reservoir bank with waggons and rails. It is certainly cheaper, but consider the risk of a burst! If the bank should burst (as one or two have done) when made with waggons on rails with high tips, the loss in material interests and in compensation will far outweigh the additional cost of making the bank in a sounder manner in thin layers. So much for the probable ultimate cost of the work. The graver considerations of probable loss of life we do not enter upon, further than to mention that by the bursting of the Bradfield Reservoir embankment of the Sheffield Waterworks 250 persons were killed—not the directors of the company, or any of them, neither any shareholders that we know of, but 250 persons, chiefly hammer-men and grinders, and their families, with some small shopkeepers and their families. Well, there is no sort of satisfaction in regarding the case in any aspect; but, as a fact, the consequence of it has been to pull off 2 per cent. of the dividends of the Company ever since.

The seat of an embankment such as this now being described slopes down the valley, crosswise of the bank. The layers of earth, however, should not follow that inclination on the lower or outer side of the bank, but be raised up at and near the foot or outer edge, so that the inclination shall be the reverse of that of the natural surface, and be downwards towards the puddle wall. The upper or inner side of the bank should be treated in the same manner, unless the natural surface has a considerable slope of itself, in which case the layers may be deposited conformably with it. The object of this, like that of forming the bank in regular layers, is to prevent slips. For the same reason the seat of the outer portion of the bank should be stepped, so that the mass may not rest upon an inclined base, and tend to slide bodily away from the puddle which it is designed to uphold.

By the time that the middle part of the puddle-trench has been filled in, the bank will have been thus raised towards the outer edge or foot of the slope on each side. The puddle is then continued upwards as a wall, backed up with earth on each side, with a batter on each side of 1in. in a foot. It should never be allowed to be below the earth-backing, for then it is difficult to prevent lumps of earth or stones rolling into it. It is important to protect the faces of the puddle-wall from becoming dried, and so cracked, diminishing the thickness of useful puddle, and for that purpose, as well as to form a sort of gutter in which to work the puddle, a rampart of sods should be laid along each side of the puddle-wall, and kept up a little in advance of it. Another precaution may be taken to protect the puddle-wall—viz., to select the most retentive material at command to be placed adjoining this rampart of sods, of the width, say, of the puddle-wall itself.

The width of the top of the bank depends in some measure on its height, and varies from 12ft. to 24ft. in practice, 15ft. and 18ft. being common widths. The outer slope is soiled with the top soil removed from the seat of the bank. This seems to complete the earthwork of a reservoir embankment.

We have taken what we consider to be the scientific and proper view of the action of the forces to be resisted by a reservoir bank, and it follows upon this view that the inner portion of the bank should be made, where possible—that is, where the material at command for the formation of that part of the bank is of such a kind—of hard and porous material, so as to allow the water that enters it (and which cannot be prevented altogether) to drain out again into the reservoir as fast as the water in the reservoir is lowered by being drawn off, or as fast as the porosity of the material will allow, and so prevent slipping of the saturated earth. But we feel bound to say that this is not the view taken by everyone, although we believe it to be the general one. The other view is that the inner portion of the bank should be made, as far as possible, to resist the passage of water through it to the puddle wall, this being looked upon only as a second defence—a sort of help to the inability of the inner bank to prevent the passage of more or less water through it—a sort of stop-gap to it. Upon this view it follows that the inner portion of the bank should be made of the most retentive kind of earth that can be procured, and the ever present thought in raising it should be that itself is to form the barrier to the passage of water out of the reservoir. As it would, however, be almost impossible to make it so perfect with the materials ordinarily at command, the puddle-wall is looked upon as doing the duty of stopping any water that may find its way through the inner bank. With some experience in the matter, however, we are unable to agree with this view, and think that the puddle-wall should be depended on solely for the watertightness of the reservoir, and that the aim in the construction of the banks which uphold it should be so to dispose the material as to prevent its slipping. The system of making reservoir banks in India, as described by those who have had experience in that country, is to have no central core of puddle, but to make the whole bank one homogeneous mass. But we have seen how different the manner of raising a bank there is to what it is or could be in England, or perhaps in Europe, and certainly in America. The question depends on the rate of wages and the condition of labour. In India the whole question is one of labour, that being there abundant and cheap. In Europe and America it is a question of labour combined with skill in construction, and the use of mechanical implements.

BOOKS RECEIVED.

Life of Richard Trevithick; with an Account of his Inventions, by Francis Trevithick, C.E. (London: E. & F. N. Spon), is a history of the steam-engine rather than of Trevithick. There is a vast amount of imformation in the book, but it is not so put together as to induce the general reader to persevere in its perusal. The illustrations are exceedingly good.—*Railways or No Railways; the Battle of the Gauges Renewed*, by R. F. Fairlie (London: Effingham Wilson), is written by its author in defence of his well-known narrow gauge method of railway construction, and in reply to some strictures recently published by the Hon. Silas Seymour, of New York.—*Health and Comfort in House Building*, by J. Drysdale, M.D., and J. W. Hayward, M.D. (London: E. & F. N. Spon), contains the results of a practical trial made by the authors of a scheme of house ventilation through the kitchen chimney by means of a syphon shaft, and a foul air chamber communicating with each room by means of a separate pipe. These arrangements were afterwards described in a paper read by Dr. Hayward before the Architectural Society of Liverpool. (See Building News, March 8, 1872—Vol. XXII., p. 191.) In the present work all details of the plan are given, and in an appendix is added a review of the methods of calculating the draughts in hot-air flues.—*The Fifty-one Hour Wages Reckoner*, by a retired banker (Edinburgh: Johnstone, Hunter, & Co.), consists of computations per week and hour for a working month, with a supplementary comparative table applicable to weeks of 48, 54, 57, and 60 hours respectively.—*Perspective; or the Art of Drawing What One Sees*, by Lieut. W. H. Collins, R.E., F.R.A.S. (London: Longmans, Green, & Co.), is a successful attempt to explain the rules of perspective. The author takes his stand between two classes of writers—artists and geometricians—neither of which supply the want felt by students learning to draw from Nature. A few useful hints on colour are added.—*On the Drainage and Sewerage of Towns*, by John Phillips, C.E. (London: E. & F. N. Spon), is a reprint of a paper read in February last before the Philosophical Society of Glasgow. It advocates the separate system of drainage, which Mr. Phillips claims to have originated and not Mr. Menzies, as is usually supposed.

SCHOOLS OF ART.

Crystal Palace Company's School of Art, Science, and Literature.—The award of prizes to lady students in two of the art classes of the school was made on Saturday last, after which a private exhibition of the works submitted in competition took place in the studio, and was visited by a very large number of the students of the school and their friends. Mr. Louis Haghe and Mr. H. G. Hine officiated as judges for water-colour painting, the class conducted by Mr. Edward A. Goodall. The silver medal was awarded to Miss Turner, of the Lawn, Tulse-hill, for a drawing of the "Pompeian Court—Interior;" the certificate of merit to Miss Elizabeth Farquhar, for a "Study in the Egyptian Court;" and commendation was accorded to works by Miss Edith Farquhar, Miss Turner, and Miss Flora Teulon. Mr. Joseph Durham, A.R.A., and Mr. Thomas Woolner, A.R.A., were the judges for modelling in clay, the class conducted by Mr. W. Shenton. Miss Ellen Cooper, of Sydenham-hill, took the silver medal; the certificate of merit was won by Miss E. A. Edgington, of Teviot House, Upper Tooting; while several works, especially medallion portraits and basso-relievos, by each of these ladies were commended. About 50 water-colour drawings and 70 works of sculpture were submitted to the judges.

London.—The examination of students' works submitted from night classes for drawing, and from schools of art in competition for payments and prizes, has just been concluded. From 397 night-classes, 56,016 works have been received; from 114 schools of art 73,226 works have been sent up, making a grand total of 129,242 drawings, models, or paintings which have been executed in the classes during the year ending in April last. This is an increase over 1871 of 19,051 works. These works were first submitted to a preliminary examination, each school being taken separately by a committee of examiners, who awarded 1,100 third-grade prizes, and at the same time selected from the mass 1,208 of the best and most advanced works for reference to the national competition, in which all the schools of art in the country compete with one another. Ten gold, twenty-five silver, and sixty bronze medals have been awarded, together with a number of prizes of books. The prize works of this competition, together with as many of the other competing works as space could be found for, are exhibited in the western gallery on the ground floor of the South Kensington Museum, where they will remain open to the inspection of persons interested in art-education, and to the public, until September.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Edinburgh Architectural Association.—On Wednesday week, the closing meeting of this Association for the present session took place, Mr. W. Morham, vice-president, in the chair. A communication was read from the president, Mr. H. J. Blanc, regarding the business of the session and the projects for next session, the most important of these being a room for library and reading purposes, where members may study the valuable architectural works in possession of the Association. There seems to be a prospect of the Engineers' Society and the Architects joining together in this scheme. The secretary, treasurer, and librarian read their respective reports. Office-bearers were elected for the ensuing session, including Mr. John Paterson, president; Mr. H. J. Blanc, vice-president; Mr. James Ballantine, jun., secretary; Mr. W. T. Russell, treasurer; and Mr. Thomas Bonnar, jun., librarian. Intimation was made by the secretary that Mr. David Bryce, R.S.A., and Mr. J. T. Rochead had signified their intention of presenting two prizes to be competed for by apprentices of not more than five years' standing for the best series of drawings of domestic or ecclesiastical buildings in Scotland.

Leeds Academian Society.—The members of the Leeds Academian Society had a pleasant excursion on Saturday to Adel Church. They were met by the incumbent, who gave a descriptive lecture of the history of the church. The font was stated to be the same age as the church, which was built about the year 1130, in the reign of King Stephen. An elaborate description was given of the inner arch of Norman architecture, its ornamental and representative figures, and also of the Norman architecture of the church. The company afterwards adjourned to the vestry to inspect the rare antique specimens of Roman, Saxon, and Norman relics of great interest, consisting of hand stone grinding mills, of original and primitive construction, and other objects of interest, found in the neighbourhood where a Roman town or encampment existed. After tea the company visited the different places of interest in the locality, and again returned to the church, where Mr. Lowthwaite gave a brief and eloquent description of the church, its architecture, history, and his views of the representative figures in the porch and also in the inner arch.

LAND AND BUILDING SOCIETIES.

Dalton and Furness Permanent Benefit Building Society.—The annual meeting of this society was held on the 19th ult. at Dalton Castle. From the report read by the Secretary it appeared that the profits for the year ending June 30 last, arising from the funds of the society, including a balance from last year's report of £117 16s. 8d., amounted to £496 15s. 4d. This enabled the Committee to place to the credit of each investing member fifteen-sixteenths of a penny for every £1 deposited four weeks, leaving a balance of £150 4s. 4d. to be divided amongst future dividends. At the present time there are 98 subscribing members, representing 177½ shares, and 33 purchasing members, representing 86 shares. The balance from last report was £1,026 3s. 7d. The members' subscriptions amounted to £1,112 15s. The repayments from borrowers were £1,422 5s. 7d.; interest, £333 11s. 5d.; and other incidental receipts, making a total of £3,950 14s. 4d. The members' withdrawals during the year were £1,373 2s. 10d.; advances to purchasers £775 14s. 6d. and other payments making a total of £2,193 8s. 11d., leaving a balance in hand of £175 5s. 5d. The report was unanimously adopted.

Industrial Dwellings Company.—The half-yearly report of the directors of the Improved Industrial Dwellings Company (Limited) has been issued, from which it appears that the usual dividend of 5 per cent. is recommended, after providing the necessary contributions to the reserve funds for repairs and redemption of leases, and placing £5,000 to a reserve fund for the equalisation of dividends. It will be remembered that this company was founded by Sir Sidney Waterlow (who still presides over it) in 1863. The number of workmen's dwellings now erected is 1,268, and the outlay on capital account for the same, including cost of sites, is £185,820.

THE TEMPLE OF DIANA AT EPHESUS.

IN the BUILDING NEWS for July [illegible], 1871 (Vol. XXI., p. [illegible]) [illegible] by Mr. Wood at a meeting of the Society for the Encouragement of the Fine Arts, and more recently, February [illegible], 1872 (Vol. XXII., p. [illegible]) —we [illegible] further particulars of Mr. Wood's important investigations. In connexion with the recent Conference of Architects a large party of [illegible] visited the British Museum to inspect some of the fragments which have been brought over to this country from Ephesus, and on that occasion Mr. Newton, of the British Museum, [illegible] of which a report will be found in our issue for June 14 last (Vol. XXII., p. [illegible]). A recent number of the Saturday Review contains an interesting [illegible] account of the explorations [illegible] has [illegible] carried on [illegible]. We heartily endorse what is said in the concluding sentences of the Reviewer, for, in the words of the [illegible] "The harvest is ripe [illegible] and [illegible] it gathered by foreign hands coming in at the eleventh hour? Shall we let French or German archæologists [illegible] Mr. Wood's [illegible] and rob him of his well-earned laurels? So lame and impotent [illegible] would be unworthy of the race which, whatever its shortcomings in literature or art, has been wont [illegible] that [illegible] wherever [illegible] patience [illegible] perseverance, the sagacity which long experience renders almost prophetic, and the judgment which [illegible] to supply material means, British travellers have ever been found in the foremost rank." In this connection, we are glad to see that the Royal Institute of British Architects is taking steps to promote the success of the labour of love in which Mr. Wood is engaged.

In a shed which for many years contained the long-lost remains of one of the Seven Wonders of the World, the newly-found relics of another and still more renowned of those wonders are now to be seen. For, by an arrangement unusually in keeping with the fitness of things, the space at the British Museum which was until recently occupied by the marbles from the Mausoleum is now devoted to the first fruits of the fortunate discovery of the great Temple of Diana at Ephesus. That discovery is in itself of so interesting a nature, and the results to be expected from it may prove so important, that too much attention can scarcely be directed towards it. It is no light matter that, after so many unsuccessful attempts, the shrouding mantle of time should have been, at least to some extent, drawn aside, and that we should have been able to obtain a glimpse of the fallen majesty of that famous edifice which the ancients accounted the crowning effort of Ionic architecture, and which was to the [illegible] of Asia Minor what S. Peter's at Rome is to the Christian world.

From immemorial times the Ephesian river Cayster has gone on "making land," its annual inundations leaving behind them an alluvial deposit which raises the level of the plain and slowly encroaches on the sea. In the early period of their history the Ephesians kept the river to some extent within bounds, but as time went by their harbour began to fill up, and after the [illegible] of the King of Pergamus to clear it had resulted in failure, it was abandoned to its fate. From that period the old city which surrounded it—as distinguished from the new city built on higher ground at a later date—seemed gradually to sink as the level of the plain rose, until at last its walls lay buried beneath some 20ft. of marshy soil. The Ephesus of the present day, called by its inhabitants Aiasoluk, consists of "a few miserable houses, and a few hovels, some of them leaning against the pillars of the great aqueduct that strides across the plain," at some distance from the river and the marshes. Of the glories of the past but little remains. The whole neighbourhood of the modern village of Ephesus is strewed with marble relics, and where the ancient city stood lie the ruins of many [illegible] the Great Theatre, which [illegible] persons, and the Odeum, or smaller theatre, both of which have been [illegible] the outline of the harbour may still be traced by [illegible]

But the building for which every Western spectator of this scene of desolation long looked most [illegible] vast an edifice should have completely vanished, though it was known that the Goths sacked and destroyed it in the third century of our era, that the Byzantine Christians subsequently used its ruins as a quarry, [illegible] that for centuries the Cayster has been yearly spreading a fresh pall of alluvial deposit above its buried remains. Successive travellers suggested various localities as its site, most of them attempting to identify it with some of the massive substructures still visible. On the Admiralty chart of the Gulf of Scala Nova, issued in 1836, the position of the Temple is conjecturally laid down on the north side of the city, and in Mr. Falkener's elaborate work on Ephesus, published in 1862, it is supposed to have been at the head of the harbour, on the west of the city. In the year 1863, Mr. Wood began his explorations, "with no funds" (says the Report of the Committee of the Dilletante Society—a memoir to which we are greatly indebted), "except what he ventured out of his private means: with no implements or other plant; with no dwelling-house at hand, and with no kind of assistance from others, except a firman obtained for him by the Trustees of the British Museum." Beginning with the Odeum, Mr. Wood proceeded to clear out the area of the Great Theatre, the scene of the uproar on the occasion of S. Paul's visit to the city. There he found a number of inscriptions, one of which furnished the first clue to the discovery of the Temple. After clearing out the Great Theatre, Mr. Wood discovered what he had good grounds for supposing was the Magnesian Gate of the city. From that gate, according to Philostratus, a *stoa*, or covered portico, led to the Temple of Diana, intended to yield shelter in bad weather to processions; and outside the gate he had discovered Mr. Wood found, about 11ft. underground, "an ancient road, with tombs on each side, pointing in a north-east direction, and at the side of this road a row of bases or square piers, such as would have served to support a *stoa* like that of Damianus." This road Mr. Wood continued to explore during the years 1867, 1868, and the first half of 1869, and in the meanwhile he discovered "another ancient way leading from a city gate near the Stadium towards the Turkish village of Aiasoluk," along which also were tombs and bases of piers indicating a line of portico. Thinking it probable that these roads converged towards the Temple, Mr. Wood followed their track, and in April, 1869, he "struck upon the angle of the *peribolos* just where it might have been expected to be." In this wall was an inscription stating that the Emperor Augustus had rebuilt the *peribolos* wall round the Temple of the Goddess Diana. Two other inscriptions at a little distance stated the distance from the river and the width of the road at the points where they occurred. From the angle of the *peribolos* on which he had thus lighted, Mr. Wood proceeded to trace the two lines of wall as far as he could. By November, 1869, he had followed the western wall for about 1,150ft., from south to north; but it then bent towards the west, and no further trace of it could be found. Meantime he had sunk a number of pits within the preserved area of the *peribolos*, in hopes of lighting upon the Temple itself. In one of these he came upon "a pavement of square blocks of fine white marble, 9in. thick, laid on a level bed of black marble, as was the practice of Greek architects in laying the floors of their temples," together with two marble sculptures. "These remains lay buried under 18ft. of alluvial deposit, the lowest stratum of which was composed of splinters of fine white marble, which appeared to have been partially calcined by fire." Proceeding with his explorations on these [illegible], Mr. Wood, in 1870, [illegible] several drums of Ionic columns, ranging from 4ft. to 5ft., of white marble, with fine joints;" by January, 1871, he had enlarged the area of his excavation to about 100ft. square, over the whole of which space drums of columns and other architectural marbles were strewn, and in February a fragment of the lowest drum of a column, 6ft. 1in. in diameter was found in its original position on its base. As it was clear by this time that the site of the Temple had been discovered, the explorations were continued on a greater scale.

From this sketch of the history of Mr. Wood's discovery—one for which no slight praise is due to his intelligent and unwearied perseverance—we may turn to the consideration of its products, some of which have already arrived at the British Museum, while others are on board two ironclads, now, we believe, at Plymouth. Among these are, to use the words of the report we have already [illegible] so freely, "the lower drum of a column, nearly entire, with figures sculptured on it in relief, and large fragments of two or more drums, similarly sculptured; also the base of a pilaster, sculptured in relief on two [illegible] as the drums." The sculptured drums are evidently portions of the thirty-six columns of the Temple which Pliny describes as cœlatæ, or "sculptured in relief." The largest of these, which weighs eleven tons and a quarter, bears on its least-injured side a composition of six figures, three of which are supposed to represent Hermes, Victory, and either Hera or Demeter. A figure in Oriental trousers occurs on the fragment of another drum; on the pilaster is a female figure, clad in a talaric *chiton*, who appears to be struggling with Hercules. Part of another figure is seen on the return face of the pilaster, and above the sculpture on the block are the remains of a bead-and-reel moulding. The fragments do not suffice to settle the question as to what were the subjects chosen as the sculptural decorations on the thirty-six cœlatæ columnæ, but it is probable that the sculptors selected Asiatic myths connected with the early history of Ephesus—a likelihood enhanced by the occurrence of the figure in Oriental *Anaxyrides*. The sculptures on the largest drum appear to have been at least well calculated for their purpose of architectural decoration, and if each drum of the thirty-six cœlatæ columnæ was adorned with similar reliefs, each column being 60ft. high, a richness of effect must have been attained of which we have no other example in Greek architecture. Perhaps the Beautiful Gate of Herod's Temple at Jerusalem was adorned with decorations of this kind. Now that we know what Pliny meant by his cœlatæ columnæ, we are able to appreciate the sagacity of Professor Donaldson's conjecture that the outlines of these sculptured columns may be discerned in the representations of the Temple of Diana on certain Roman coins of the Imperial period. On these coins one of the fronts of the Temple is shown with an octostyle portico, and, on a close inspection of the columns, figures in relief are to be seen on their shafts, from their bases to about a third of their full height. It should be remarked that on these coins sculpture in the round is indicated in the pediments, and of this sculpture, which must have been on a colossal style, we may expect to find fragments *in situ*.

Among the other architectural marbles sent home by Mr. Wood are two fine specimens of Ionic capitals, and a base found in its original position with part of the lowest drum of a column still standing on it. There are also several fragments of columns on a smaller scale which must have belonged to the interior. We do not yet know enough of the plan of the Temple to decide whether these smaller pillars are to be reckoned among the 127 columns with which, according to Pliny, the Temple was adorned. Each of these, he says, was the gift of a King; and, in curious confirmation of this statement, the excavations have brought to light several fragments of inscriptions on the *torus* moulding round the bases of columns, which, in all probability, actually record dedications of such a nature. The architectural marbles present many other interesting features: some of the smaller fragments, for instance, retain traces of red colour, while the calcined surface of other marbles, and their charcoal smears, tell the sad story of some ancient conflagration in which probably perished the beautiful timber roof and the staircase cunningly wrought in vine-wood.

A survey of these fragments, taken in connection with the narrative of Mr. Wood's operations already referred to, tells us just so much about the Temple as makes us eager for that fuller and more precise information which we can hope to obtain only when the mass of marble now cropping up everywhere under the alluvial deposit of the Cayster has been examined by intelligent eyes. Ionic architecture, which may be said to have been indigenous in Asia Minor, and to have been thence, in all probability, transplanted to Athens, attained its final development in the great Ephesian Temple—an edifice in which, as in the Mausoleum, and the almost contemporary Temple of Minerva at Priene, we recognise, though only defaced and mutilated fragments can offer their evidence, that freshness and vigour in the execution, that versatility and felicity of adaptation in the application, which distinguished all Greek art in its best days, and still continued to be its characteristic as late as the reign of Alexander the Great, and perhaps up to the middle of his century. That is precisely the period when the history of Greek art, which we may still trace through a series of extant examples from the archaic period up to that point, breaks off abruptly, leaving a vast chasm between the reign of Alexander and the Augustan age.

Knowing, as we now do, something more than we did about the school of Scopas and his compeers, the next chapter in the history of ancient art should be the comparison of this school with that which immediately succeeded it, and of which Lysippus is the reputed founder and eponym; and it is on the site now being explored at Ephesus, more than, perhaps, on any other spot in the whole Hellenic world, that we are likely to find those missing links in the chain of evidence which Winckelmann sought for in vain in Roman galleries. Such an enterprise as Mr. Wood has undertaken, ought, when once begun, to be carried out to its legitimate conclusion. Let us have not a petty, partial, faint-hearted experiment, but a real, thorough exploration, carried out, as in former expeditions, with all the means and appliances which a liberal and enlightened Government has at its command. Otherwise envious foreigners may say that we had better have left the Temple sleep on beneath the twenty-feet-deep covering of alluvial soil in which the Cayster had entombed it.

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THE JOINERS' AND COACHMAKERS' COMPANIES AND TECHNICAL EDUCATION.

THE prizes awarded to the candidates in the competitions organised by the Joiners' Company were distributed yesterday (Thursday) week, at a court of the Company held at Guildhall. The Master, Mr. J. Johnston, jun., presided, and the wardens present were Mr. J. Wynter, jun., and Mr. H. L. Phillips. Specimens of the work for which the prizes were given were exhibited, and were much admired. In presenting the first prize to Mr. W. Hodges, of the Spitalfields School of Art (for original design), the Master said he had to express the gratitude of the Court that such beautiful specimens had come before them. They had offered these prizes to induce those who were training for skilled trades to do all in their power, not simply to raise themselves to distinction in their own branch of art, but to raise the national character. The other prizes from this school were to Messrs. T. Russ and W. Shuter. The first prize in building construction was awarded to Mr. W. B. G. Lewis, student at the Charterhouse School of Art for two-and-a-half years. These designs were sent by ten students. The other prize for this school was gained by Mr. F. Ansell. There were three prize-takers from the Birkbeck School of Art, Messrs. T. V. J. Sennett, W. H. Sweet, and R. C. Miller, the latter being for mouldings applicable to ceilings. The prizes consisted of books on architecture and cases of mathematical instruments. The Master addressed a few words of encouragement to the candidates on their leaving. He said it would be for them to show to all around that they were industrious and persevering, and would make the best of surrounding circumstances. Nothing good and nothing great could be achieved without these qualities. They should show they were determined not to "scamp" their work, but raise each one his branch of industry in the eyes of the world. Mr. Bedford thanked the master for distributing the prizes, and said that he himself had never felt prouder of their old company than now, when he saw it engaged in the work of that day. The Master replied, hoping that all succeeding masters would take as great pleasure in such a work as he had. He thought they were well carrying out in it the principles on which that company was formed.

The Company of Coach and Coach Harness Makers have awarded their silver medal to F. Budd, coach-body maker, of Tything, Worcester, for a set of five drawings in ink of an omnibus, single brougham, landau, barouche, and Victoria phaeton; and their bronze medal to W. C. Bolt, coach-body maker, 18, Georgiana-street, Camden Town, for a drawing in pencil of a landau body to scale.

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HIGHWAYS.

THE highways of the nation, says the *Pall Mall Gazette*, town streets and country roads, are maintained by divers authorities and interests, the whole of which it is not easy to discover. In towns the maintenance of streets usually devolves on municipal councils or on similar bodies; in London upon the vestries under the Metropolitan Local Management Act. The last-named authorities disbursed no less than £725,000 for the repairs of roads, streets, paths, and for cleansing and watering the same in the year 1869-70; this irrespective of the cost of lighting. What the municipal boroughs and the Towns Improvement Commissioners expended for the same objects the official returns do not disclose. Local Boards of Health raised in 1869-1870 £104,000 as highway rates. Roads commonly so called are made and kept up partly through the agency of turnpike trusts applicable to England and North Wales generally; but for South Wales the trusts are under a special statute, the 7 and 8 Vict., cap. 9. But where, as in the majority of cases, roads are maintained by rates, the management falls into the hands of distinct sets of functionaries, with, of course, distinct jurisdictions. These are (1) highway divisions under 12 and 13 Vict., cap. 35, in which a separate highway rate is raised; (2) highway districts under 25 and 26 Vict., cap. 61, and 27 and 28 Vict., cap. 101, obtaining funds by precept served on the overseers, and by them paid out of the poor-rates; and (3) South Wales districts formed under 23 and 24 Vict., cap. 68. Bridges, which form an integral part of the highway, are in country districts paid for out of the county rate. In towns they would be probably built and maintained out of the town funds. In populous places the erection of a bridge is a commercial speculation, and as such does not come within the purview of taxation. Finally, we have a number of bridges and ferries which appear to belong neither to town nor to county, but to the parishes in which they are situate. They are necessary to our traffic, but are not numerous or very important. The revenue raised from them last year was under £100,000. We recently showed what is the taxation and expenditure under the existing turnpike trusts. The contemplated transfer of the powers and duties of the Secretary of State under Turnpike and Highway Acts to the Local Government Board makes it of interest to ascertain something of the rates and the outlay under the last-named statutes. It is stated that Mr. Stansfeld's department will be entrusted with the duty of completing the extinction of the remaining turnpike trusts—what the toll-payer will save by the change the ratepayer will have to bear, assuming he obtains no aid from the Government. In view of the future his present fiscal condition is of interest—

		Rates paid during the Year 1870.
Highway divisions (12 and 13 Vict. cap. 35):—		
Rates	£555,330	
Work in lieu of rates	16,838	
		£572,168
Highway districts (25 and 26 Viet. cap. 61; 27 and 28 Vict. cap. 101):—		
Rates		728,081
Highway districts, South Wales (23 and 24 Vict. cap. 68):—		
Rates		46,550
Total impost		£1,346,799

Besides the rates there are certain other receipts which carry the total up to £1,394,320. On the expenditure side of the account we have the cost of manual labour, £532,301; steam labour, £212,421; materials, £379,095; tradesmen's bills, £63,339; salaries and common charges, £98,552; improvements, £30,767, and a number of miscellaneous charges which, added to the preceding items, make a total of £1,398,070—a sum remarkably close to the receipts. Should turnpike trusts be entirely abolished and the amount of their present revenue from tolls cast upon highway rates, the latter would be increased to £2,200,000 a year, or thereabouts.

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KENT ARCHÆOLOGICAL SOCIETY.

THE centre of the operations of the Society this year was the old town of Faversham, in East Kent. The annual meeting was held on Tuesday in the Faversham Institute, under the presidency of Earl Amherst. The Rev. W. A. Scott-Robertson read the fourteenth annual report, which stated that the Council could give, as always, a satisfactory account of the progress of the Society. The members steadily increased, and were growing beyond the number of 1,000, about which they have hovered for some years. Forty new members had been elected in the year, and many more were awaiting election at their hands that day. The balance at the bankers was £512 16s. 9d., but the greater half of this would be payable in a few days to the printers, engravers, &c., for the expenses of the eighth volume of "Archæologia Cantiana." The archæologists then proceeded to inspect the parish church, a spacious cruciform structure, partly in the Decorated, and partly in a later style. The Rev. C. E. Donne, the vicar, described the church, and drew attention particularly to some fine fragments of mural painting on the walls of the north aisle near the chancel. The principal figures represent a king, a judge, and a pilgrim. The tower is a handsome square Norman one with a singularly beautiful pinnacled top. The Elizabethan Grammar School, a fine specimen of the domestic buildings of that period, was next visited, and the site of the ruins of Faversham Abbey proved to be interesting. The edifice was originally built by King Stephen and his Queen, in 1147, for monks of Clugny, who being afterwards released from all subjection to that order, the foreign monks became Benedictines. The abbey was confiscated by Henry VIII., in 1538, when its revenues were valued at [illegible]. Its abbots, during the reigns of Edward I. and Edward II. sat in thirteen several parliaments. In this monastic institution were interred King Stephen, his Queen Matilda, his son Eustace, and many other noble personages. The oratory belonging to the ancient abbey has been converted into a dwelling-place. The Roman saints Crispin and Crispianus are said to have found an asylum near this town, where they were apprenticed to a shoemaker. Davington, a small village about a mile from Faversham, then became the centre of attraction. Many urns and other Roman vessels, as well as coins of several Roman Emperors, have been discovered here, which makes it probable that this was once a Roman burial-ground. Fulk de Newnham, in 1153, founded a priory for Benedictine nuns near the church, which is now occupied as a gentleman's residence. The church has been recently restored, and is under the same roof as the Priory. Its chief beauty is the elegant Norman arch over the west door, and it contains many interesting monumental relics of the gentry of the neighbourhood. On leaving Davington the archæologists returned to the town, where the annual dinner took place at the Mechanics' Institute, Lord Harris in the chair.

On adjourning into the reading-room, papers were read by the Rev. C. E. Donne, on "The Tragic Story of Arden of Faversham;" by Mr. F. F. Giraud on "The Ancient Charters of the Corporation," and by Mr. Bedo on "The Roman Remains discovered at Faversham."

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THE SCHOOL BOARDS.

ALDERSHOT.—At the last meeting of the Aldershot School Board, plans of a school, playground, &c., were received from the following architects:—Mr. Stapley (cost £2,650), Mr. Mussellwait (£2,500), and Mr. Wonnacott (£2,495). Mr. Mussellwait's plans were accepted.

LONDON.—At the weekly meeting of this Board, on Wednesday, Mr. C. Reed, M.P., in accordance with notice of motion which he gave last week, moved the adoption of a recommendation of the works committee to the effect that Mr. E. R. Robson be appointed architect of the Board, at a salary of £1,000 a year, with a view, among his other duties, to his designing and building the schools of the Board, and with the understanding that he give "his time" to the Board, and that the Board provide the necessary staff and offices. The proposition gave rise to some discussion, in the course of which the Rev. J. Mee requested the clerk to read the original agreement Mr. Robson had entered into with the Board. The Clerk read the original agreement which had been entered into with Mr. Robson. It appeared from it that Mr. Robson had agreed to devote his "whole time" as architect to the Board at a salary of £500 a year. Mr. Reed, M.P., stated that Mr. Robson had found it necessary to devote more than what was generally looked upon as the whole of an architect's time, and that in future he would have to attend to far more important duties than heretofore. For instance, Mr. Robson, under the new arrangements, would have to draw up plans and specifications for all new buildings to be erected under the auspices of the Board, no matter who the architect of these schools might be. The motion was then agreed to *pro tem.*, and it was referred back to the works committee to make arrangements by which Mr. Robson might be relieved of the duty of looking out for sites and negotiating for their acquisition. Mr. Charles Reed, M.P., brought up a report from the works committee, respecting the preliminary arrangements necessary to the erection of new schools in various parts of the metropolis. The result was that the Board confirmed a provisional agreement entered into by their clerk and Mr. A. Pocock, for the purchase of his interest in the Winchester-street school, Islington, and a resolution passed on the 26th June for the purchase of a site in West-street, Hackney, referred back to the works committee to negotiate with Mr. Podmore for the purchase, at a cost price for valuation, of a site, with the infant school upon it, in the neighbourhood of S. Michael's Church, South Hackney, and appointed architects to erect new schools on Eelbrook-common, Chelsea: in York-road, Islington; in Cottenham-road, Finsbury; in Wilmot-street, Bethnal-green; in Harper-street, New Kent-road; in West Ferry, Millwall; and in South-road, Brockley-road.

The design of Mr. F. W. Roper has been chosen in a limited competition of four architects for schools to be erected in Great Hunter-street, Old Kent-road. Accommodation is provided for 1,040 children. The estimated cost is £7,600.

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Dr. Letheby has been elected President of the Association of Medical Officers of Health.

The death is announced of Mr. W. Bridges Adams, a well-known engineer, and a large contributor to the scientific literature of the day. Mr. Adams devoted much attention to the improved construction of railways and railway carriages, the methods of applying brake power, and other matters connected with the working of railways; and many of the plans invented by him are now in general use. He was in his 75th year.

THE JULIUS ELLIOTT MEMORIAL SCHOOLS.

THESE schools, now in course of erection in Brighton, are intended by his relatives and friends as a memorial of the late Rev. Julius M. Elliott, whose lamented death by an accident on the Alps in July, 1869, will be remembered by most of our readers.

The plans have been approved by the Educational Department, and comprise a school-room for 60 infants, a school-room and class-room for 132 boys, and a school-room and class-room for 140 girls, accommodating 332 children in all, with a private room for visitors.

The external walls are being built hollow, faced with Suffolk white bricks and red kiln and blue Staffordshire brick string courses and arches. The copings and keystones of arches will be of Bath stone, the roofs covered with the patent Broomhall tiles, and the buildings internally plastered in Scott's cement. There will be sufficient ventilation secured by means of open fireplaces fitted with "The Abbotsford" stoves, windows provided with hung sashes, and ventilators in floors and ceilings.

The contract price for these schools, including all internal fittings, desks, and galleries, heating and lighting, forming playgrounds, boundary walls, and privies, &c., is £1,812. Messrs. Goulty & Gibbins, of London and Brighton, are the architects; Mr. Albert Baker, of Brighton, the contractor; and Mr. James Reid the clerk of works.

MODERN ENGLISH ARCHITECTURE.

SOME short time back (BUILDING NEWS, Vol. XXII., p. 315), we quoted from the *Westminster Gazette* a proposition for the establishment of a really national school of art, or university, according to the analogy of other schools of learning, with its professors, examinations, degrees, &c., &c. Such a school or university, the writer endeavoured to show, would get rid of the confusion and uncertainty which now reign in architecture. The same writer (who uses the initials "J. H. B.") returns to the subject in last week's *Gazette*, and in the course of his remarks he notices the celebrated article in the *Quarterly Review*, which, he says, if the writer is correct in the theory he has propounded, simply overturns at one blow all that has previously been believed in regard to what has constituted the genesis of art, and its culture. Amid the most unsparing denunciations and admirable criticisms of things as they are, and almost all present architectural results, much of which is undeniably true, and interesting, and suggestive, he (the *Quarterly Reviewer*) demolishes everything in the nature of an architectural *profession*, and insists that the builder —the working man—is the only true artist and architect, and that to his unfettered instinct we must turn for the spontaneous generation of a national art growth; first sweeping away everything in the nature of concocted plans and stereotyped designs, and that then we shall find that art will spring up with a perennial freshness and beauty, and again yield that satisfaction and delight which it is admitted the best Greek and Gothic art ever did, and does! Now, is this theory true? If it is, says the writer in the *Westminster Gazette*, such a scheme as that suggested by him, instead of being for the true culture of art, would be its death-blow, delivering us yet the more over to a stereotyped "professionalism," which, according to the *Quarterly*, is just *the* spurious element we have now to cast from us. If the writer has *not* shown—as he certainly has not—that art ever *has* been developed thus, the attempt he made to do this being very lame indeed, and *actually* rested *only* on his asserting that effigies of the architects of the Mediæval buildings could still be seen thereon in a working dress (!) then the theory doesn't go for much, and the course he recommends, however interesting, would be a perilous one. But without arguing the matter out ourselves, as it is very much a question of *fact*, it will be sufficient to quote Plato, whose evidence is direct to the point. He says, adverting to the fact that able architects were rare, even in Greece, in the whole of which very few could be found, "The pay of a common builder was five or six minæ, but that an architect would require more than ten thousand drachms." Plat., *Σρασται*, ed. Serran, t. i., p. 135. Now this, says "J. H. B.," is totally destructive of the writer's theory, and conclusively shows that however much it may be desirable the architect *should* be the builder—and this may be admitted—yet that of old there was the most recognised distinction of the architect as the superior and governing mind, and that neither builder nor working man, in the ordinary acceptation of the words, is to be credited with the glorious works and all the refinements of exquisite taste and poetic results which the ancient buildings are instinct with. No; it was *the man of genius* then, as now, that was wanted—no doubt supported and quickened by, and working with, others of kindred spirit and genius in their spheres, and, it may be freely supposed, even the working men were imbued with the true spirit of art and a knowledge far beyond what we see now. Well, then, to *find* the master minds, to give *scope* to the art faculty in all directions, is what we want, and this, we think, can only be done by the reverent study and combined pursuit of art in a National Art School, where *all* classes of mind and ability, quickened each by the other, would find their true place and value, and art be assigned a dignified position, and be carried onwards free from the influence of "shop" and commercial rivalry. The quotation from Plato must, "J. H. B." thinks, be deemed conclusive that the writer in the *Quarterly* is not sustained by precedent where it is most required. That the mathematical knowledge, the optical refinements, which, while the sublimation of utility were also an embodiment of an art-expression which has chained the highest minds in all ages, *could* be the mere outgrowth of the haphazard efforts and traditions of the workman, and not the concrete of an ideal born from the contact of genius, is too much for belief on such data as those furnished by the *Quarterly*.

LIGHTNING CONDUCTORS.

THE *Morning Post* says it would be something worthy of achievement if all the terror which affects timid people who find themselves in edifices when a thunderstorm rages in the vicinity, if all the apprehension of people not timid, but thoughtful, could be abated, if all the cowering in cellars and wrapping in blankets which one now sees on those occasions could be done away with by the confidence based on irrefragable grounds that, come what might, the place was safe. Now, any electrician would affirm that a judicious application of lightning conductors would effect all this. Moreover, it is not as though there did not exist data for the proper application of these conductors. The absolute safety we are claiming for our dwelling-houses has been achieved for the navy for some considerable time past. There was a time when accidents to ships from lightning strokes were frequent, but, so far, at least, as ships of the British navy are concerned, no such accident is ever now heard of. So far as relates to British war ships absolute safety from this cause of occasional danger has been accomplished, and that simply through the embodiment of known electrical laws into a practical application. If these statements be irrefragable, as we affirm them, then why is not a specific lightning conductor made as much an ordinary appendage to a dwelling-house as a system of gas or water-pipes? Apathy, stupidity, are words which comprise the answer; yet knowing, as we are compelled to know, how evils only contingent and temporary are usually let alone, we do not entertain the remotest hope of seeing the remedy brought into use.

ETCHINGHAM.

THE noble church of Etchingham [the great or oaks' hamlet], dedicated to God, the Assumption of S. Mary, and S. Nicholas, is a conspicuous object from the Tunbridge and Hastings railway, and seated in the midst of a moat now filled up; in it, tradition says, lies a holy church bell, which he who finds, and with the help of six yoke of white oxen, restores to upper earth, will be richer than Crœsus himself. The date of the building may be fixed at about 1375, from the appearance of the arms of Brittany in the glazing, which fix it between 1372 and 1380. The whole aspect of the church is French, the vast central tower and its pyramidal cap and banner-shaped vane, the noble square stair-turret with a rounded top, the lofty elevation of the roofs, the absence of a transept and the richly-intricate tracery of the two-light windows, with cills high above the ground, betoken a foreign element in the design; and one of the Echynghams who served with Edward III., and had his epitaph written in French, seems to have brought back some Frenchman with him. The nave, which has aisles and a clerestory, is of two bays, extending to the eastern coigns of the tower, which covers the constructional third bay, and with the aisles extended to this point forms a *quasi* transept. The south porch, of oak, retains its original bargeboard, which describes a huge trefoil. The chancel retains some encaustic pavement (blue with devices of complicated golden stars, like ajuleios), and beautiful stall-work of oak (eighteen in all, three in each return, and six on either side), with open arcading of trefoiled lights in the rood-screen toward the nave, a kind of battlemented cornice, and carved misericords—representing two front faces of ladies with the head-dress of the time of Henry IV., two dolphins, two roses, and two cowled foxes preaching to geese. The stone basement is pierced with quatrefoil air-holes. The door is on the south side, and in the easternmost bays the windows are stilted up; on the north wall, externally, there are remains of a sacristy, wfth the water-drain. The chancel, of the latest Decorated period, retains its own water-drain, a stone credence, and triple-canopied place for priest, deacon, and sub-deacon.* The eastern window, flamboyant in character, retains some fine glass. The steps do not extend from wall to wall, but occupy only the middle space; on each side are projections with tiles. The eastern window of the north nave-aisle is of three lights, and has in the abatements four quatrefoiled circles in lieu of tracery, with angels playing upon instruments of music—the "Powers" are identified by a battlemented tower—part of a grand design, probably, to pourtray the heavenly choir. The nave and chancel arches of the tower are Late Decorated, of the local type; the arcade of the nave is later; the windows are square-headed, with two lights; the west window was designed to be longer, and is Perpendicular. The brass of the rebuilder of the earlier church, of the time of King John, Sir William de Etchingham† (who died January 18, 1387), and that of a namesake (died 1412), with his wife Joanna (1404), and son, Sir Thomas (died 1444)—under a triple canopy—and a plate for another Sir Thomas (died January 20, 1485), are on the floor of the chancel, which was restored in 1860. The helmet of Sir George Strode has disappeared. The dedication to S. Nicholas connects the church with the ancient ferry across the Rother, which was at one time navigable to this point. The font is Early English. The broad west door with a continuous moulding should be noticed. The original pulpit-stone remains. In October, 1758, the great bell was sent to London to be sold. It bore the inscription "Stephanus Nortone de Kant (ia) me fecit." There is a beautiful and majestic yew at the south-west angle of the churchyard. Remains of the moat which defended the manor house are still visible on either side of the railway.

The armorial glass in the nave now includes these coats:—

1. Ermine.
2. Az. Fretty of six, arg. a chief, gules. Etchingham.
3. Gules a fess, ermine. Wallis.
4. Or. on a bend, sa. 3 horse shoes. arg. Shoysewell, wife of Sir W. de Etchingham.
5. Gules, 3 bezants 2 and 1. Dyngham.
6. Sa. 3 crowns 2 and 1, or. [part of a series of royal arms?] See below.
7. Sa. a Sagittarius or. [K. Stephen].

In the last century the glazing including the following arms:—

East window.—Edward Prince of Wales, Edward III., John of Gaunt, John Duke of Bretagne; still remaining. North windows.—1. Shoysewell, Etchingham Az. fretty of six, arg. 2. Thomas Holland, Earl of Kent, died 1396; Ralph Stafford, Earl of Stafford, died 1372. 3. Warren, Earl of Surrey, died 1347; Robert de Vere, Earl of Oxford, died 1392. South windows.—1. Etchingham; Edm. of Langley, Earl of Cambridge, died 1362. 2. Wm. de Montacute, Earl of Salisbury, died 1397; Hugh de Courtney, Earl of Devon, died 1377; Fitzalan, Earl of Arundel, died 1375; Edmund Mortimer, Earl of March, died 1381. 3. Wm. Ufford, Earl of Suffolk, died 1381; Thomas Beauchamp, Earl of Warwick, died 1401; Hastings, Earl of Pembroke, died 1375.

The other coats were:—South nave aisle Az. fretty of six arg. a label or. (in another coat an annulet above the fess point), Etchingham. Sa. a sun in his splendour, S. Clair. West window, Wallis. North nave aisle—Ermine, a cross ingrailed gu. Northwode 2 Arg. a cross ingrailed gu. Dalingrugge. West window. Etchingham. Clerestory; South. Az. a cross patonce, or. North. Sa. Ducal crowns or. The east window had a shield, paly wavy of six, gules and or. There was a monument in the chancel with these arms 1 and 4. Gu. a lion ramp. between 6 crosses or. 2 and 3. Sa. 3 leopards' heads jessant fleurs de lys or. On the brass of Wm. Echyngham these arms were impaled "2 chevrons and a canton:" —"a bend" within a bordure ingrailed—"3 crescents and a canton quartering 3 birds." The Communion Plate bore an "escutcheon with 3 horseshoes in bend, with this inscription: "Clavibus potius, 1679." MACKENZIE E. C. WALCOTT.

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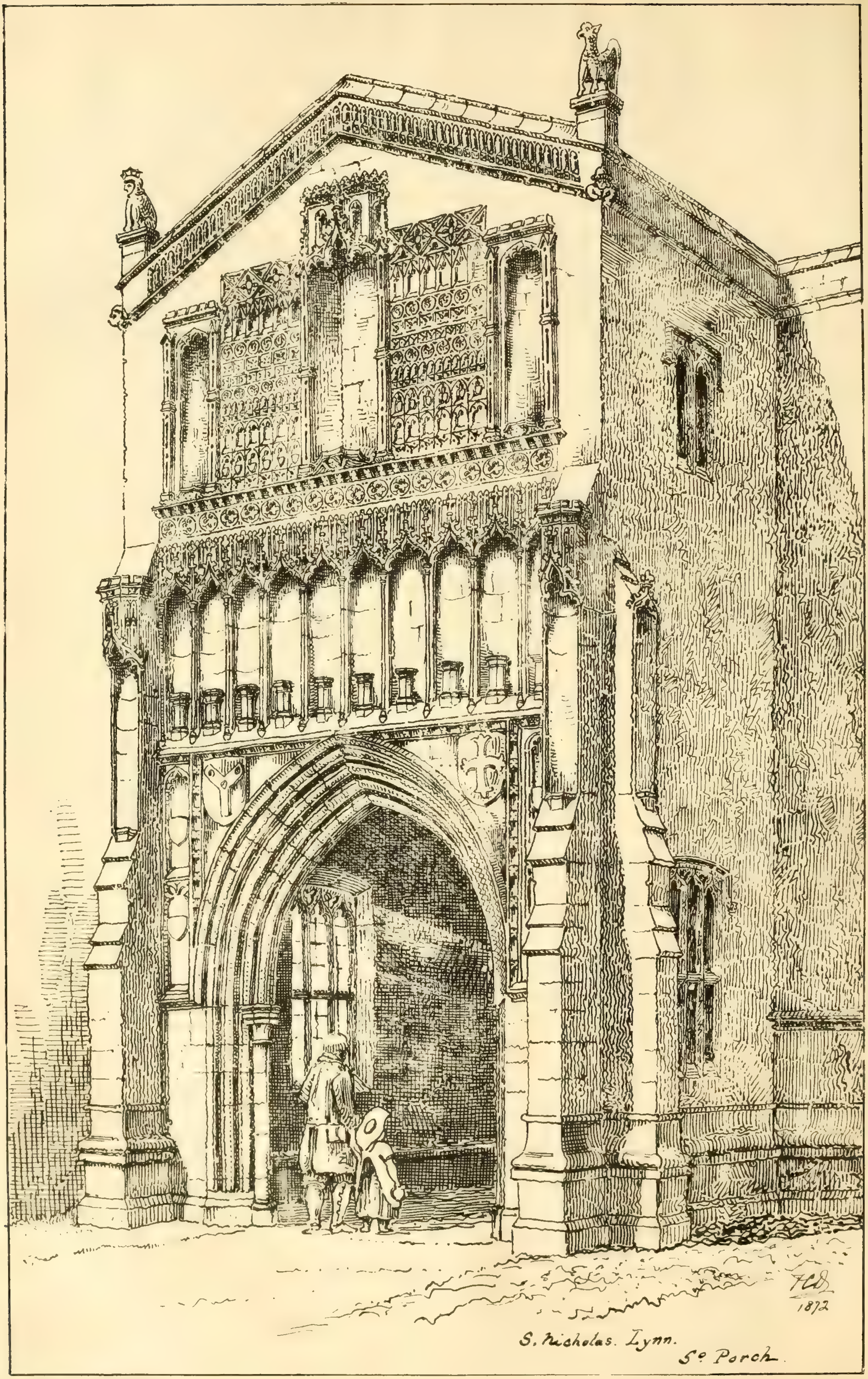
* "Sieled seats at the altar end" in an inventory of Southampton, and this phrase in the *Grey Friars' Chronicle* I have found to be the proper English term for such seats. A monk of Glastonbury gives the appropriate phrase "the solar between the pillars," instead of triforium.

† The epitaph says:—"Iste Willelmus fecit istam ecclesiam de novo reedificari."

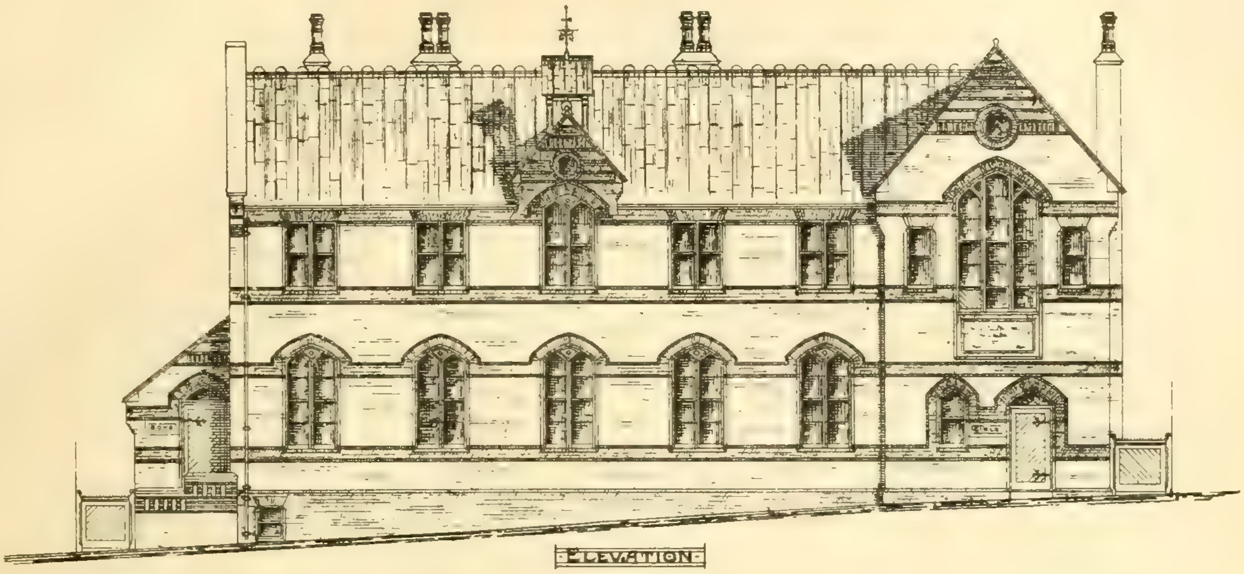


S. Nicholas. Lynn.
S° Porch

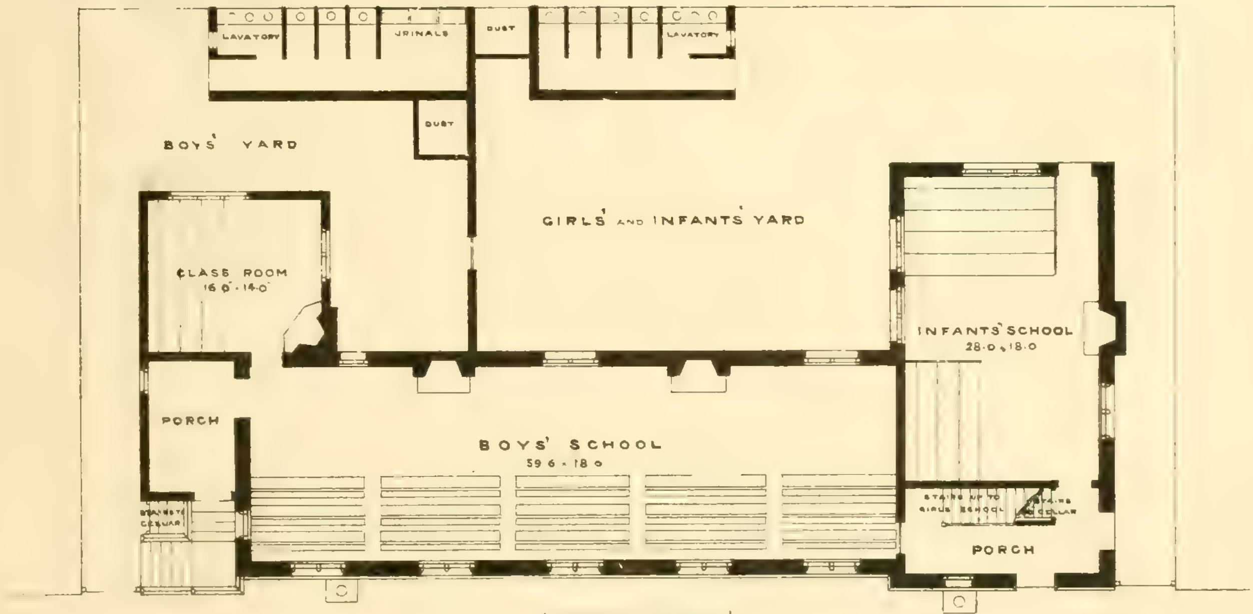
Printed by Whiteman & Bass Lith. Holborn

"THE JULIUS ELLIOTT" MEMORIAL SCHOOLS

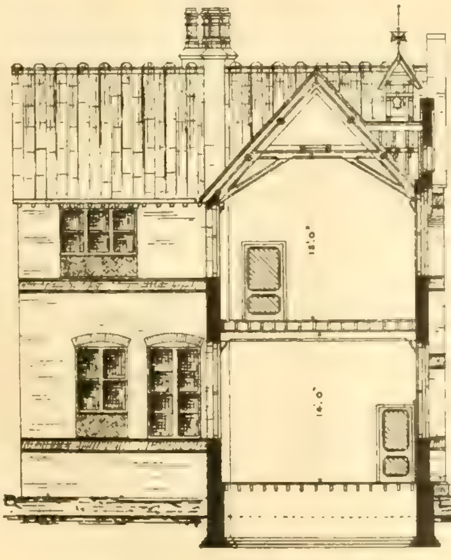
MOUNT STREET BRIGHTON

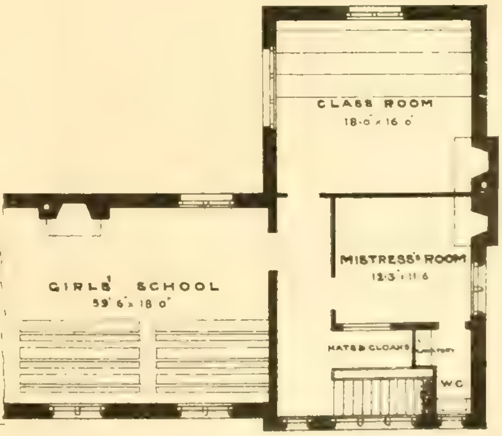


ELEVATION



GROUND PLAN





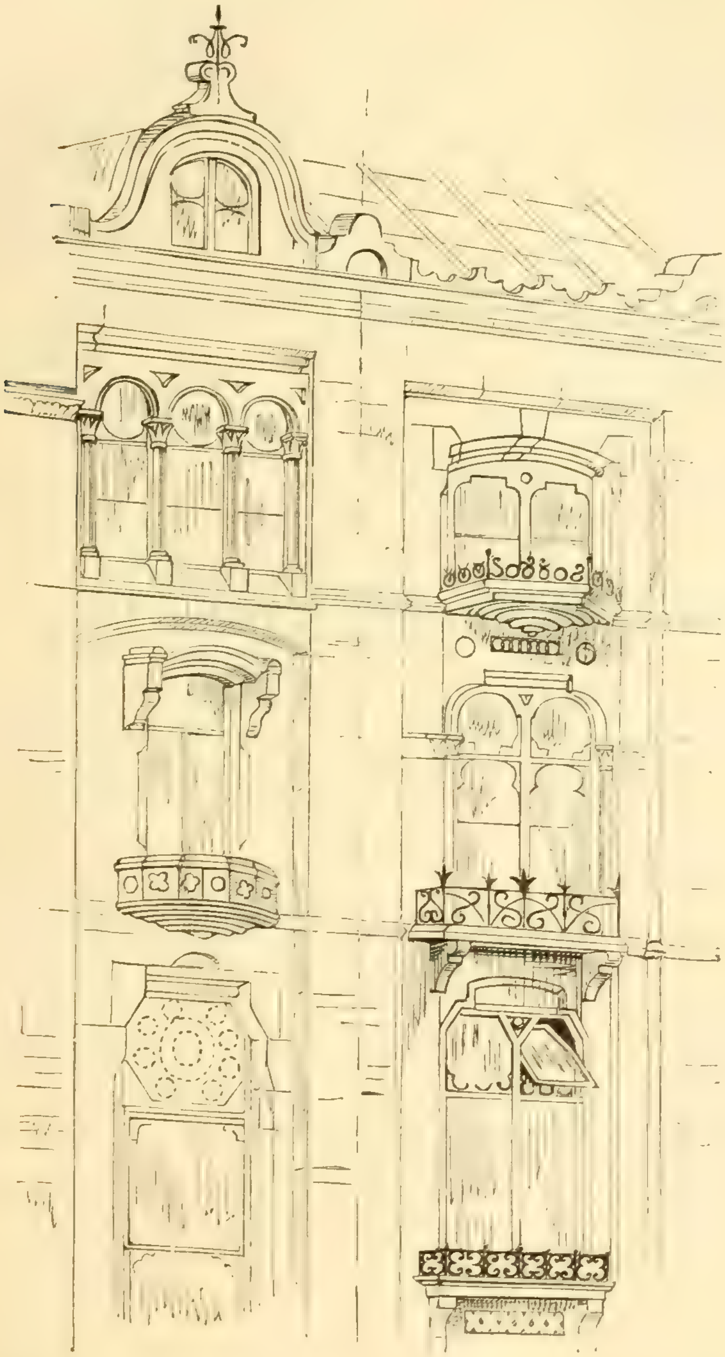
CROSS SECTION

PART OF FIRST FLOOR PLAN

GOULTY AND GIBBINS
ARCHITECTS

THE PROXIMATE PRINCIPLES OF ARCHITECTURAL DESIGN.—V.

IN the preceding papers the external aspect of windows has been chiefly considered, and we cannot leave the subject without referring to their vertical connection or superimposition in design. In street thoroughfares this is an important element for the architect to consider, and the manner in which it has been dealt with in London and other large towns within the last half century shows that architects felt the need of some connection. The fenestral modes adopted by French architects seem to have been freely introduced, and we owe much of the improvement to foreign ideas. Such a mode of vertically connecting the light apertures is, moreover, logical in its intention, as it forms another link between the main parts or members of a structure and its minor accessorial or decorative features. Fenestration, in fact, becomes an integral part of design, instead of a haphazard and desultory manner of placing windows. Besides the strength and relief obtained by thickening the intervening piers, it affords shade and shelter from the weather, and a means of projecting hoods and balconettes from the several windows without unsightliness. In this way, frequently, a projecting balcony may serve also the purpose of a covering to the underneath window. (See sketches.)



Internally, the treatment of window openings may somewhat differ from the external form. Well-splayed jambs, we have seen, should always be obtained both for utility and effect, and the heads, as a rule, in ordinary buildings with low flat ceilings should be square, or approaching that form. The angles may be relieved effectively by being canted or cut off by the lintel or wood frame, and this adds little to the expense of workmanship. Though internally flat or square-headed, there is no reason to insist on this shape externally, as there is no law or necessity to confine the head to a level line outside; but here judgment and taste of a higher order must dictate in most cases. Relieving arches, filled in underneath with some pattern in stone or terra-cotta, may sometimes pleasingly take off the bare or heavy appearance of the superincumbent wall, though such expedients are often overdone—when, for instance, a high-pointed arch is placed over a small window to carry really nothing, but merely for effect, as we frequently see in the works of modern or fashionable Mediævalists. These and like vagaries are the results of the copying spirit of the present age, which will always produce absurdities in design as long as it is tolerated and encouraged, too, by some of our foremost practitioners. As long as we have "genuises" who will not encourage original thought in design, so long will antique substitutes which require no study be foisted upon us.

After form, the next thing that claims attention in considering internal window design is the filling-in woodwork or framework. I have already spoken of the manner in which this may be improved as regards form or outline. Mullions and transoms, although ancient expedients, may often be used as a filling-in of the square aperture. Common sliding sashes, as readily as casements, can be fitted, and these often might be improved by the square angles being relieved by inserting cut corner pieces. Transversely, also, the light may be divided by transoms, which enables smaller casement frames to be fitted. These may often be made to open on pivots placed either at the sides or at the top and bottom. One advantage of these transoms is that in a high narrow aperture a considerable part of the window could be made fixed or immovable, and another advantage, the opportunity of inserting painted or stained glass in the head or at such portion of the aperture as may be desirable, as it is not always necessary or judicious to have a window entirely filled with it. For ventilation, there is no doubt our common sashes, double hung, are the best at present known, as we can regulate to a nicety the ingress of the cool air at the bottom, and the egress of the heated air at the top, but I think a more desirable means could be devised, and one I have adopted—namely, to have sliding or opening valves at the top and bottom of the sashes, which latter may be fixed or movable at pleasure. By this means the sashes need be seldom or never opened, and there would be no unpleasant draught from the meeting rails being left apart, as is frequently the case. The object in every case is efficient ventilation, but under control, and this cannot be attained by opening or hinged casements of ordinary construction. Means of removing or opening the whole aperture, however, should be provided in case of emergency, as that of fire.

Blinds to regulate the light, and shutters for protection, here claim a passing word. I think the principle of Venetian blinds, adapted externally, is best; the rays of the sun are thrown off before penetrating the window. The "helioscene" is a useful adaptation of this principle, while it does not obstruct the view from the window; some means, though, should be devised to close the horizontal shades, so that it may serve as a shutter as well. Inside, boxed shutters are awkward, cumbersome expedients, to say nothing more, and it seems singular that sliding or lifting shutters are so seldom used in their place. One of the cheapest and most effective sunblinds is that known as the "Florentine," or simply canvas suspended from a roller, and projecting outwards at an angle by side stay bars, which can easily be regulated.

G. H. G.

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S. Mary Magdalen Church, Paddington, having had a narrow escape from destruction by fire, is now said to be in serious danger from water. The roof having been destroyed, the church has, of course, been open to the recent storms, and so vast an amount of rain has fallen that Mr. Street apprehends danger to the foundations. These had to be laid on very bad ground, and are composed of thick layers of concrete, a mode of building which added greatly to the cost.

The works for the new City terminus of the London, Chatham, and Dover Railway, at the Holborn Viaduct, are being energetically pushed forward, and a large section is already completed, several of the arches at the upper level having been asphalted. The Metropolitan Railway passes underneath below the ordinary level of the street, and there is then the line of Farringdon-street proper, very considerably below the road level of the viaduct, the several railway levels and inclines from Ludgate being in course of construction at intermediate elevations; whilst the large hotel, which will be built above the office department of the station, will rise in all 100ft. above the topmost railway level of the Viaduct.

Building Intelligence.

CHURCHES AND CHAPELS.

Chawton.—The parish church of Chawton, destroyed by fire in the spring of 1871, just after the restoration of the interior of the former building had been completed, was reopened on Saturday week. The nave has been entirely rebuilt, as also the north aisle. The exterior is of rough flint, faced with Bath stone. The principal entrance is through the base of the tower, which is at present unfinished, but temporarily roofed in. The roof is tiled in alternate bands of light and dark shades. The sittings, providing accommodation for about 300 worshippers, are of varnished yellow deal. The architect is Mr. A. W. Blomfield, of London, and the whole of the work has been executed by Messrs. W. & J. H. Dyer, of Alton. The cost of erection has been about £2,000.

Chislehurst.—Christ Church, Chislehurst, was consecrated on Monday last, the 29th ult., by his grace the Archbishop of Canterbury, with the usual formalities. The building is most happily placed on the summit of a beautiful site, presented by N. Strode, Esq., of Camden Park. The Church is carried out in the Early Decorated Gothic, after designs supplied by William G. Habershon & Pite, architects. Accommodation is provided for 525 adults, and great care has been taken to give every facility for egress. The church consists of nave with clerestory aisles, north and south transepts and chancel, with vestry at north-east angle. Externally it is built of Kentish Rag stone in regular courses, with dressings and ornamental parts executed in Bath stone, and roofed with Whitland Abbey Green slates and purple Bangor in alternate courses. A lofty tower and spire is placed at the western extremity of the nave, and is utilised on the ground floor as one of the principal entrances, and in the next stage has an organ-gallery approached by a turret staircase. The interior has a handsome nave arcade, with carved capitals, and good effect has been obtained by relieving the Bath stone with Red Mansfield for the smaller columns which carry the roof principals in nave and chancel. The roofs throughout are open-timber, boarded and felted. The chancel has an apsidal end with two-light windows in each compartment, and the floor laid with ornamental tiles. The pulpit and reading-desk have been placed in the most convenient positions for commanding a view of the whole congregation. The aisles are paved entirely with red and black tiles, laid diagonally with black margins, and the windows filled with cathedral glass. The internal dimensions of the church, exclusive of chancel, are 72ft. by 53ft. The general works have been carried out by Mr. Carey, builder, of Highgate; the tile floors by McColla, of Victoria-street; the gas chandeliers by Berry, of Pimlico; and the ornamental ironwork to boundary fences by Messrs. Hart, Son, Peard & Co., of Wych-street.

Ducklington.—The parish church of Ducklington was reopened on Wednesday week after partial restoration. The work which has been completed embraces the relaying of the floor of the church, reseating of the nave and north aislé, cleaning and repairing the masonry of the pillars, the removal of a singing loft and formation of a vestry, the removal of the pulpit and reading desk from a pillar in the centre of the nave to the north and south sides of the chancel-arch, and the opening of some windows which had been partially blocked up. The builders employed were Messrs. Bartlett, of Witney, under the direction of Mr. Bruton as architect. The chancel was completely restored and reseated by the Rector during last year.

Galashiels.—Operations have been commenced towards the completion of S. Andrew's (Roman) Catholic Church, Galashiels. The church was partly built in 1856. The present addition is from plans by Messrs. Goldie & Child, and adds 40ft. to the length of the building. The front elevation, according to the plan, is 72ft. high, and 50ft. wide, flanked with octagonal buttressed towers of the same height as the central elevation. Inside, the additional space acquired is to be occupied principally by an organ gallery. This gallery is to be of stone, supported on three arches, and finished with a stone balustrade. The contract is in the hands of Messrs. R. Hall & Sons, builders, Galashiels.

Llanarth, Cardiganshire.—This church has just been reopened after extensive alterations. The nave and chancel were modern, and have been entirely remodelled, with new windows, roofs, and fittings, and the ancient tower repaired. The expenditure has been about £900. Mr. Withers, of London, was the architect, and Messrs. Jones & Sons, of Llwyngog, builders.

Old Hutton, near Kendal.—The works are in progress for a new church, dedicated to S. John Baptist, Old Hutton, near Kendal. The old church is entirely removed, being dangerous and beyond repair. Originally, the church was one of the most ancient in the diocese, but was rebuilt about a hundred years ago, when all vestige of the old structure disappeared. The new church will consist of a nave 54ft. by 26ft. without side aisles, an apsidal chancel, porch, vestry, and organ chamber, and a belfry spire at south-west corner, 55ft, high. The style is the thirteenth century; materials, the dark blue stone of the locality, and white freestone dressings; open-timbered stained roofs throughout; seats and church furniture of pitch pine and oak; sittings for about 200. The architects are Messrs. Brade & Smales, of Kendal; the contractor, Mr. John Fawcett, of Hutton.

Southport.—The new church of S. Peter, Birkdale, was consecrated by the Bishop of Chester, on Tuesday, the 23rd ult. The church is in the Early Geometric Decorated style, and is built of bricks, faced with Upholland pierrepoints, with internal dressings of white Stourton, and external dressings of Cefn, stone. The building consists of nave, 81ft. 5in. by 21ft. 7in.; north and south aisles, each 81ft. 5in. by 11ft. 8in.; and chancel, 22ft. 4in. by 18ft. The organ-chamber is placed at the south-east angle, opening into the nave and chancel by arches, and the vestry is located at the corresponding north-east angle. The principal entrance is through the tower (not yet completed), which is on the south side. The roof is open to the apex, with circular ribs springing at intervals from stone corbels; it is of pitch-pine, stained and varnished, and is covered with Welsh slates, laid in parti-coloured bands of blue and purple. The nave columns are of polished Westmoreland granite, the font is of Caen stone, and the pulpit and reading-desk of selected pitch-pine. The seats are also of pitch-pine, and will accommodate 550 persons. The passages in nave and aisles are paved with Peake's terro-metallic tiles; the chancel floor has been laid with encaustic tiles, in ornamental patterns, by Mr. G. F. Chantrell, of Liverpool. The east window has three lights, and is filled with stained glass by Messrs. Forrest & Co., Liverpool. The west window of four lights, and the two-light aisle-windows, are glazed with "cathedral" glass, arranged in geometric patterns. The clerestory windows are quatrefoils. The total cost of the building is about £2,400. The general contractor is Mr. Hugh Yates, of Liverpool, and the architects are Messrs. T. D. Barry & Son, of the same town.

Southsea, Hants.—The Congregational Church for the new district in the Dover road has been completed and dedicated. It is built in the Early Decorated period, and consists of nave, apse, east and west transepts, and aisles. The foundations are also put in for tower in north-west angle. The extreme length is 92ft.; width, 62ft.; height to ridge, 54ft. The pewing is of pitch pine, and fitted to accommodate about 650 persons, with standing room for about 150 others. A commodious school-room was first erected in the rear of the church, and worship has been conducted therein during the erection of the church. Mr. Stent, of Warminster, Wilts, was the architect. Mr. Smith, Portsea, the builder. Mr Barnden was the clerk of the works to the whole.

Wetheral, Cumberland.—The restoration of this church is commenced; the contract has been taken by Mr. Orniston, of Warwick. It is intended to complete the chancel before proceeding to commence the nave and aisles. The Dean and Chapter of Carlisle undertake the chancel, the rest falling on the parish. Mr. Withers, of London, is the architect. The estimated cost is about £2,000.

BUILDINGS.

Crockford's Club House.—These celebrated premises, in S. James's-street, were lately sold to some influential capitalist, and will shortly be altered and partially rebuilt for the purposes of a first-class political club. Mr. C. J. Phipps, F.S.A., is the architect.

New Public Institute, Leven, N.B.—The foundation stone of a public institute was laid here lately with Masonic honours. The plans of the building have been prepared by Mr. Andrew Heiton, architect, Perth, at an estimated cost of £1.212. The style adopted by the architect is Venetian Gothic. Accommodation is provided on the ground floor for a library, reading-room, bath-room, and housekeeper's offices, and on the first-floor, billiard-room, two class rooms, lavatory, &c. The structure is being built of freestone from local quarries. It is intended to form art classes in connection with the Science and Art Department. The ground around the building will be laid out as recreation grounds, with a bowling green, &c.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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Received.—D. H. & J. N.—W. S. & Son.—G. G.—H. W. & Sons.—R. M. P.—H. T.—T. & R. B.—P. M. J.—P. & Sons. —H. W. & Sons.—H. F. C.—J. P. S.—W. J. S.—C. & H. —E. W. G.—J. N.—J. B. B.

S. Trevail.—You write a long letter partly in ink and partly in pencil, which we can scarcely read. You say, in a postscript, "Please excuse this. I hope you will be able to make it out. I have not time to copy it.' We don't excuse it, and we think that courtesy alone should have suggested more consideration. What is worth doing, is worth doing well. If you write to a person on business, it is not polite, to say the least of it, to write in such a manner as to consume a great deal of his time in endeavouring to make out what you say. In so doing, you want to save time at the expense of somebody else's time. In this instance you have written a long letter in answer to "H.'s" letter last week. What you say may be very good, but, judging from the little we can decipher, we very much doubt it. Would it not have been better to have put what you had to say in a more readable form, and so have increased the chances of the letter being printed? Would it not also have been more polite to Editor and Printer? If in writing to *one* person you should be careful, how much more necessary is it that you should be careful when you expect your words to be read by thousands? If you desire to continue the correspondence with "H," or any one else, on "School Planning,"give a little more time to what you have to say, and to how you say it. Don't use a long word when a short one will answer the purpose; don't use two sentences when one will do. Endeavour to put the right word in the right place in the sentence, and the sentence in the right place in the paragraph. Regard letter-writing as a work of Art, and Literature as incomparably the greatest art that ever existed or ever will exist, an art which exercises more influence on mankind than all other arts united. When you look at Literature in this way you will feel a reverence for it, and you will not then write ill-digested letters, partly in ink and partly in pencil, in sprawling characters—lined, interlined, and erased. You will rather write a letter for publication as you would make a drawing for a bit of ornament, to be put in some conspicuous place for the purpose of interesting and educating men.

J. W. T.—As we cannot use the title-page for some months the conditions of the competition are postponed for a short time.

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Correspondence.

PLYMOUTH.

To the Editor of the Building News.

Sir,—Before the visitor sets out for Plymouth he had better dismiss from his mind the remotest prospect of any treat being in store for him in the shape of street architecture. The most vulgar erections done in stucco had too firm a root in the emporium of the West to be upheaved in a day. We searched in vain many of her streets, in the dull hope of finding some gem, like, as it were, "a star in the darkest night sticks fiery out indeed" from the gloom of the surroundings. Even in the heart and centre of the busy borough, tall, lank, flimsy erections rival each other in the hideousness of their display. We look, but cannot find but faintest symptoms of the revived arts in the home of George Whitwick (alas, just passed away). The Hoe, which is a remarkably open and beautiful place, rising rapidly from the harbour, contains two large blocks of superior class houses, also done in stucco (great bugbear of modern taste). In the newest block, elaborate detail and fenestration have been carried to their utmost limits, but with restless and unhappy results. Wide circular-headed windows are filled with thick stucco tracery, in the shape of a double arch, a cement foliated boss being suspended from the centre by, we suppose, a wrought iron bolt. This is a marvellous way in which a wide window and tracery may be combined, but to the entire neglect of true construction and absence of æsthetical effect.

The Duke of Cornwall Hotel, which is so well known, will always repay a visit. Various kinds of materials have been used here in juxtaposition, terra cotta principally for the window decorations; but it looks somewhat frail and fantastic in combination with the more solid and permanent looking Cornish granite and Devonshire limestone, which are used in large quantities. Terra cotta is in truth more suitable to brick architecture. This, the respected architect, Mr. C. F. Hayward, has admitted by stating at the Institute some time ago that he would not again use the three in combination. The building, however, looks remarkably well, and had the materials been more in harmony both in colour and design, and the front a little less broken in outline, it would have formed one of the most appropriate and effective hotel buildings which we have seen in our travels.

The Roman Catholic Cathedral is remarkable not so much for its architecture, as for that of the tower, which rises to a great height, but on plan it is extremely small. The chief entrance to the church is through the tower. On the upper stage three very long lancet windows on each face filled with enormous luffers almost absorb the design, leaving a very small proportion of solid masonry to support the lofty spire that rises immediately above. At this part the design is thin and trumpery; undoubtedly it is effective, but of the kind which should be carefully eschewed. Few architects can be found who would care to win a name in the profession by designing works so lofty and slender as this. Moreover, we were given to understand that some difficulty was experienced in finding a builder and foreman to undertake the task of erection The spiritual wants of this neighbourhood are apparently well supplied, for almost treading on the heels of the Cathedral is a very large Presbyterian Church of Palladian style, in which some unhappy Gothic detail has been mixed. We now come to the Guildhall buildings in course of erection. By the narrow approach from the west, which sadly wants improving, the greater part of the group bursts suddenly into view. Standing at the corner of the street (where, of course, there is a miserable gin-shop) the effect is striking. At the first glance a marvellous collection of towers and huge gables stand prominently forward. No less than three towers and four gables are at once within the compass of the eye. Perhaps a more effective bit of grouping cannot be found in this western district. There is a slight attempt at balancing of parts—thus the large hall is flanked on either side by a tall gable, but the hall being shifted towards the left an additional gable and a tower is placed to the right. The municipal buildings are separated from the great hall and assize courts by a "placa" of considerable width, so that there are two distinct buildings, though quite in harmony with each other. Let us now make a detour, and approach from the east, which is the most open and important. The tower of S. Andrew's Church, of early fifteenth century style, and well designed, is a fitting climax on the left, and although there is dignity and fitness in all we see, yet the effect is not so grand or remarkable as on the western approach. We think a mistake has been made in squeezing the municipal block on the very verge of the street, thus obscuring any extensive view of the whole group from this end. A small portion of the great hall and the flanking gable, together with the narrow end of the municipal block, is all that can be seen until we stand fairly within the "placa." We really cannot see why the smaller group should have been placed so far to the east, while so much unoccupied ground remain on the west.

If these buildings are satisfactory in their grouping, they are certainly no less so in their detail, except in a very few instances. Entire absence of fritter—or, if you will, "millinery," which, on close inspection, is sure to strike the eye—and broad massive and appropriate detail will characterise this group of buildings as one of the architectural lions of the West.

Messrs. Hine & Norman, of Plymouth, are the architects. The name, however, of Mr. E. W. Godwin appears on the illustrations as consulting architect. This is a novelty in architectural practice, and one which we entirely approve. There is not, perhaps, any profession (we do not mean mere business) under the sun so exclusive or envious as our own. It is no common thing for lawyers and physicians, and judges and engineers, to act in harmony with each other upon the same cause, but we regret it is not so in architecture. It is to be hoped, therefore, that from the example and precedent of Plymouth a long train of good will follow. Moreover, the benefits derived in this case are apparent at the first glance, and we say it with no disrespect to Messrs. Hine & Norman. There are not, so far as we know, any precedents in this western town or neighbourhood of sufficient merit or power of architectural design to form, as it were, stepping-stones from their first to their last and greatest efforts. The disparity is too great between it and what we have hitherto found in Plymouth.

Among the least happy parts of this design are the tops of the two smaller towers; they are too gaudy, fantastic, and obviously pretentious. The painted woodwork and variegated slates compel you, as it were, to gaze and wonder. We hope the large tower, the walls of which are only partly raised, will not be capped like these. The figures surmounting the large gables are too small for the gigantic cabbage-leaf-like base. Near the apex of the gable the figure of a poet's head, exceeding life-size, protrudes from a circular panel. The cabbage-leaf dwarfs the poet, but the statue above does not appear to attach itself to the design at all; it looks like a doll suspended in the air, an evident attempt to introduce, in a modified shape, the circular tower which Mr. Godwin designed for the Leicester Town Hall, at the corner of the municipal block. It is not yet complete, but we do not think it will be an appreciated feature of the building. It sits uncomfortably on its square base, and in the slice of the main block which has been cut out for it. Mr. Godwin is exceedingly partial to these round towers, but they look better on paper, with masterly draughtsmanship, than in stone.—I am, &c., H.

GREEK *VERSUS* GOTHIC.

Sir,—I shall not trespass on your space by any hopeless attempt to convince Mr. Gildard that one may worship with the spirit and the understanding in a Gothic church. Allow me to notice some points in which he is certainly mistaken.

First, as to Greek architecture being our model, as the best achievement of human genius. Is it really so? Greek sculpture and minor forms of beauty may be, but there is far more of constructive genius, and to my eye a grander resultant beauty, in the Gothic Cathedral. I do not suppose that the subtle curves of the Parthenon, or the theories of beautiful proportions which critics at one time discovered, were ever calculated by the builders on mathematical or optical principles. They had the rare merit of giving beauty to a style essentially commonplace and devoid of structural skill, piling their massive materials into elegance and beauty, and improving so far on their clumsy prototype. Their climate, too, gave them an apology for their waste of material in the depth of pillared porticoes, and huge entablatures. But their architecture was only the setting to their sculpture, and without it it seems to have a very lifeless beauty, which repetition would soon exhaust. We see only the caricature of that beauty when we see a church with said portico, &c., complete (probably facing the east wind), and serving only to screen the nakedness behind. In such churches the only thing likely to be worth looking at as a work of skill will be the roofs, and these cannot be seen for plaster. Modern Greek is too much of an innovation on the original to allow its claims on our regard as more suitable than Gothic for our churches. As to the associations connected with a style, they depend very much on the individual and the distance to which he may choose to carry his historical lore, or he may associate Gothic with what is best, and not what is worst, in the religion of the time, taking the sow by the right ear and not the left. The truth, probably, is that neither Greek nor Gothic has anything to do with keeping or hindering the majority toward worshipping in spirit and in truth. Had we lived in perilous times we should have had less anxiety, of course, as to our architecture and mode of worship, but in other times man will have beauty as well as truth. The Greek identified them, but that is no reason why we should divorce them. Some people will always find aids to devotion, where Mr. Gildard can see none, in the architecture, in the music, in the interior, if not toned with storied colour, yet subdued so that its superfluity of light, or odious monotony of whitewash, does not paralyse the optic nerve. As to stained glass, if it be good, not glaring, the eye may as well rest on a geometric pattern as on a pretty bonnet, or any other mountain of vanity, conspicuous by contrast in churches of the "barn" order.

I see nothing extraordinary in the opinion that the Classic gains in beauty as it approaches the variety for which Gothic is conspicuous. Gothic developed its beauty by study of the Classic of the Empire. In the border-land of Lombardic or Norman we see the development plainly enough, and in modern Classic or Italian, anything that breaks up the monotony of intercolumniation, and the mass of unbroken lines, is a step towards elegance and beauty, towards the Gothic, not the Greek, ideal.

I would correct Mr. Gildard also on S. Paul's own authority as to his connection with the Jewish ritual. He tells us that he never went to the Gentiles till he had made every effort to win the Jew.

With regard to instrumental music, you will think that Bible history is not popular in Scotland, when every one ought to know that a psalm is not merely a hymn, but a hymn composed expressly for music on a stringed instrument—the harp, or its modern improvement, the piano; that S. Paul or the Christian disciples were continually in the temple joining in a worship where certain families of the Levites were specially employed to accompany the singers with the grave sweet melody of the Psaltery or harp. Yet Mr. Gildard is asking for New Testament authority for the organ. We have it here in the very nature of the thing: the psalms we sing, notably the 150th; a more unquestionable authority still in the passage quoted, "singing and making melody with your hearts"—*i.e.*, singing and *playing* with the heart. If Mr. Gildard consults the Greek he will find it very plain, and no critical difficulties in the passage. If the harp must be silenced the voice is silenced too, and the Quaker is right, but playing being commended (as well as singing) with the heart, those who may have little voice, and find a help in the organ, have undoubted authority in the above passage for employing both to express the worship or the devotional feelings of the heart. Dancing, however, is different, and was employed only on rare occasions of national thanksgiving and joy. I have nothing to say against it if it were the natural expression of a sudden joy, as in many cases it has been, when truth, long known, comes to any one in the light of a great discovery. There is not much likelihood of this occurring, or of a need arising for such an expression of feeling. It may be in certain cases natural, and therefore becoming, just as I can imagine the bagpipes leading a psalm tune with all solemnity.

As to starring it in corduroy, or the kilt (with the highland fling as an accompaniment, suggested by the kilt), I would remind Mr. Gildard that he can fear no opposition on my part to his shining as a star in the orbit of his choice. It is he, not I, who is the advocate for an impossible primitive simplicity, but although he may have the moral courage I have not the least desire to see him carrying out his principles in such a way. I would much rather hear of him as subscribing for an organ; and you will probably say that it is as difficult to take the breeks off a highlandman as to put them on.

Another Protestant and Architect.

HOUSE DRAINS.

Sir,—Wonders will never cease! for, as I perceive at page 59 of your columns, Mr. Osbourne Reynolds, Professor of Engineering at Owen's College, Manchester, proposes to do away with bad smells in our houses by "abolishing all house-traps altogether, and dealing with the sewer gas outside the house." Now, that is all nonsense, for if all house-traps are abolished, I ask what is to keep down the bad smell generated in the soil and waste pipes within our houses? This reminds me of a case in point: Some twelve years ago or so a party, to save expense, ordered his plumber to fit up a series of kitchen sinks one above the other without any traps, because, as he supposed, traps were unnecessary, owing to the conducting pipe into which they were all branched discharging itself above the ground and not into any drain. It did not do, however, for traps had to be afterwards put in, owing to two causes, one being the contaminated air continually blowing into the house from the dirty pipe, and when some of the other tenants put down some extra dirty water, &c., the smell that would come up some of the other sinks was simply disgusting.

The outside syphon-traps and cesspool, as depicted at page 59, are all right so far, but Mr. Reynolds must excuse me telling him that instead of "abolishing" the house-traps, the water-closets, baths, sinks, &c., must, in addition, have all traps for themselves.—I am, &c., Plumber.

THE ROYAL AGRICULTURAL SOCIETY AND CHEAP LABOURERS' COTTAGES.

Sir,—Two prizes of the value of thirty pounds having been offered by the Marquis of Bute and Major Picton Turberville for the best plan of cottages suitable for agricultural labourers, and which were to be exhibited at the Royal Agricultural Show at Cardiff, thirty-four designs were submitted. The result has been that the prizes were withheld, for, in the opinion of the judges, want of merit. The cost of a pair of cottages was not to exceed £220, and the accommodation to be provided for each was to include three bedrooms and suitable offices, and a brick oven for common use; drainage and water supply, it is assumed, were also to be included in the cost, although the conditions did not state this, and consequently they were included in a portion only of the estimates. Detail drawings, specifications, and estimates—the latter to be a priced bill of quantities—were also required. The value of the materials was assumed to be at stated prices delivered—bricks, 30s. per thousand; sawn timber, 1s. 9d. per foot cube; princesses slates, £12 per thousand, &c. That the public may learn how the "Royal" deals with competitors in this department of their show, it is as well to state that an entrance fee of 10s. was demanded with each set of plans, and that not only was the return carriage unpaid, but the cases in which drawings were sent for protection were retained, and even the paltry booking fee, 2d., was unpaid. No other information as to the judges' award than that derived from the public newspapers was given to the exhibitors, and the only outlay on the part of the Society would seem to be the advertisements for plans, and the postage of a trade memorandum paper by a contractor of Taunton, which said, "Your plans have been returned this day." Allowing, therefore, £1 for advertisements and postages, the Royal Agricultural Society will net by the transaction about £16, and how their debtor and creditor account will treat this sum will be worth observing. What a contractor in Somersetshire had to do with the plans is another puzzle—probably he stood in the same relationship to the judges as magistrates' clerks do towards local justices of the peace.

The Royal Agricultural Society would seem to have fallen into the popular error that labourers' cottages can be built with the same description of materials and quality of labour as any other class of buildings, but at a much less cost in proportion to the size and the work to be done. The priced bills of quantities were sufficient evidence of what difficulties the designers had to contend with on this point, and the details of same would in many cases have made even a speculative builder stand aghast; £2 5s. in one instance being the allotted sum for "painting all woodwork usually painted both externally and internally, three coats of oil and white-lead paint," and £8 5s. per rod, including arches, cutting, &c., the average price at which brickwork was supposed to be done, the bricks alone, be it remembered, costing 30s. per thousand, or £6 15s. per rod.

Probably not more than three or four out of all the designs could have been carried out for the stipulated outlay, and then only under very favourable circumstances; and strange to say, Portland cement concrete, the most economic and suitable material for labourers' cottages, was represented by three designs only. Many of the plans were old friends with new faces, the Yorkshire Agricultural Society's prize plan having several representatives, but with the internal arrangements modified and the elevations varied.

The Irish Royal Agricultural Society lately adopted the sensible plan of judging the relative merits of labourers' cottages by examining a number already built, and it would have been to the interests of the general public and landed proprietors interested in homes for the people if the English Society had done the same, or at any rate have endeavoured to obtain as judges such well-known men as Messrs. Chadwick, Roberts, Habershon and Pite, and some others who have made the healthful construction of cottage homes a special study, and whose practical knowledge of modern improvements in construction and sanitary arrangements pre-eminently fitted them for the purpose.

The assumption that it is possible to build roomy and substantial cottages with all necessary outbuildings, drainage, and water supply, and at the present largely-increased cost of both materials and labour, for £220, is a fallacy that leads estate owners and agents, when they find such is the case, to imagine that others can build more cheaply than themselves, to the disparagement of their architect, clerk of works, or builder. Unfortunately, also, this preconceived notion of cheap cottages is fostered by the occasional publication of statements that superior dwellings, possessing a large amount of accommodation, and every way adapted for labourers' homes, have been erected at a fabulously low price, the statements being endorsed by the owner, or builder, or both; but as Mr. Bailey Denton justly observes, "A builder often undertakes to build cottages who has determined to abstain from making any profit on the work, or to sustain actual loss, rather than allow it to pass into other hands. In other instances a contractor will undertake cottages at an exceptionally low rate because he has other work going on at the same time for the same landowner, by which he hopes to make up any loss he may sustain on the cottages. Or it may be that the price at which cottages are undertaken is the result of a competition, in which the successful builder will often 'cast the sprat to catch the herring,' and lose money in order to obtain an introduction to a landowner, oust a rival, or to bring his name before the neighbourhood." About two years since a paragraph appeared in a London paper, and was copied into many local papers, to the effect that the writer had erected a pair of cottages, complete in every requirement, for a considerably less sum than £200, and that his architect would furnish copies of the plans and specifications of same to those who might desire them. The estimate for these cottages allowed the sum of £7 10s. per rod for the brickwork walling, including all facing, arches, &c., to accomplish which the bricks must have been delivered for less than 20s. per thousand. No eaves gutters, back gutters to chimneys, down pipes, drainage, water supply, and other necessary adjuncts were mentioned, and no washing boilers nor baking oven, both very essential in rural cottages, were provided. In this and many similar cases the measuring surveyor could make short work of such statements, and tell what the real first cost complete would be, the latter being quite a different affair from what the owner may have paid by contract. Substantial and well arranged cottages adapted for agricultural labourers, costing not more than £200 to £250 per pair, according to size, which shall be well ventilated, efficiently drained, weather-proof, and not liable to continual and frequent outlay for repairs, are still a desideratum, and the Royal Agricultural Society at their Cardiff meeting have given poor encouragement to those who in a greater or lesser degree attempted to solve the problem. Wiltshire.

BRIGHOUSE CEMETERY CHAPELS AND LODGE COMPETITION.

Sir,—I feel that it is a duty to the profession to make public the result of the above competition, trusting that the glaring injustice so obviously exercised in this instance may tend to induce competing architects to ignore in future the tempting offers of fair play and justice held out to them in the innumerable competition advertisements which daily present themselves to mislead the unwary. I will just state the particulars of the above competition, and leave the reader to form his own conclusions. The printed conditions provided by the Committee were of a clear and definite form, and had they been adhered to, would undoubtedly have given satisfaction, but this, unfortunately, has not been the case. I may say that the question of cost was made the all-important stipulation, expressed in a most explicit manner, which could not possibly be mistaken. The total cost was not, under any circumstances whatever, to exceed £2,000, and should the actual tenders for the accepted design be found to exceed this limit, the architect would forfeit his claim, and the Committee would proceed to make another award. Now, I consider this a very necessary stipulation in the present diseased state of the competitive system, and would, if strictly carried out, soon remove one of the greatest obstacles which now bar the way to conscientious competition; for then, the labours of unscrupulous competitors would be thrown away, and designs of a practical and honest character would take the place of showy and elaborate ones, which cannot possibly be executed for anything like the sum proposed to be expended. Prizes so obtained can have no honour or satisfaction attached to them except £ s. d.

As regards the present instance, it is very evident that any architect could make a more showy set of designs in such a small matter as a £2,000 pair of cemetery chapels and lodge, on being allowed to exceed the limit by the modest sum of £3,932, only a trifle short of £4,000, an excess in itself nearly double the amount which the Board pledged their honour not to exceed! The following extracts are taken from one of the leading local papers:—"A special meeting of the Board was held for the purpose of opening the tenders which have been sent in for the work required to be done in the erection of the lodge, cemetery chapels, &c., and there was a full attendance of members. Taking the lowest tenders, the total amount for the whole work is £5,932. This greatly exceeds the limits of the Local Board, which, as previously stated in the *Courier*, was £2,000. The meeting was adjourned for the purpose of giving the architects time to look over their quantities again to see if any errors had been made, and to ascertain whether the cost of the buildings might not be brought within the limit."

Is it possible to imagine a more ridiculous state of things than that suggested? Could anybody really entertain for one moment such an idea as that an architect could be so ignorant of his profession as to make a mistake of £3,932, innocently, in a £2,000 contract? My reply is: "Where ignorance is bliss, 'tis folly to be wise."

I now refer to the next abstract, showing the final result and decision of the Board:—"The minutes of the special meetings of the 12th and 18th were confirmed. Those of the latter showed that the architects for the cemetery chapels were present at the meeting, and suggested various reductions upon the lowest tenders submitted to the meeting of the Board on the 12th inst., of which we give a report in another paragraph. The amount of the reductions suggested was £488 19s. 7d., and it was resolved that the reduced tenders should be accepted, with the exception of certain items amounting to about £78.

In conclusion, I think that if the Board are enabled to spend £5,400, instead of £2,000, on the proposed chapels, they ought to act decidedly and as men of honour, granting another competition for the higher class buildings, or proceed to make another award, in consequence of the conditions not having been complied with, failing which, reimburse the unsuccessful competitors for their trouble and expense in getting out drawing in good faith, and according to their advertised requirements.—I am, &c., Nemo.

ANCIENT v. MODERN WORK.

Sir,—I was struck with the introduction to the description of All Saints Church, Hordle, Hants, as it appeared in your last number, p. 59. You say:—"This church (see illustration) is built on the site of a modern building of 30 years since, which was erected two miles further inland to replace a church of the twelfth century, then pulled down in consequence of the encroachments of the sea. Being in bad repair and of poor construction, this modern church has given place to the present." Could we have any more emphatic condemnation than this of the character of modern work? A church that stood for seven centuries was pulled down because the encroachments of the sea should not wash it down, whilst its successor, which only stood for thirty years, was pulled down because it was "in bad repair, and of poor construction." Here is a comment on modern architecture and architects, building and builders! What a contrast between the darkness of the middle ages and illumined modern times! Oh, Mr. Editor, you have done good service in exposing shams and transfixing pretensions, but you have still a world of good to do.—I am, &c.,

Sorrowfully.

PAVING OF CITIES.

Sir,—In these days of rival paving materials, asphalte, wooden blocks, &c., it may not be amiss to remember the following facts culled from a writer on the subject:—

Previous to the eleventh century Rome and Cordova were the only cities that could boast of being paved; even Paris, the beautiful, did not enjoy this inestimable advantage till the reign of Philip Augustus, who (as Rigord, his historian, informs us) observed that when vehicles passed through the mud it diffused a very offensive odour, and thereupon issued an order that the streets of the city should be paved; the city then took the name of Paris instead of Lutetia, which means a slough.

About 1285, during the reign of Philippe le Hardi, the Parisians were commanded to keep the portion of street before their houses clean, but in those days, as now, the order was but poorly obeyed, and in 1309 the city was cleansed under the superintendence of the police. The citizens of Paris were interdicted in the year 1372, and again in 1395, from throwing every nuisance over their windows. *En passant*, we may say that we know a city of the present day, in the older portions of which the above abominable practice still exists, and the inhabitants consider themselves at liberty to indulge in it providing they preface the action with the words "Tak tent."

The paving of the city of Dijon was commenced in 1391. In our own metropolis the principal thoroughfares were not paved till the fifteenth century, Holborn being done about the year 1417.—I am, &c., J. R. W.

A DIPLOMA FOR ARCHITECTS.

Sir,—I always read with great interest all letters that appear in your paper, but I seldom find any complaints made by professional architects (when I say professional, I mean those who have served their time in an architect's office) against cabinet-makers, joiners, stonemasons, &c., signing themselves architects, and who, I am sorry to say, obtain plenty of business. I read in a Yorkshire paper, of this week, tenders advertised for "Four New Villa Residences," to be built in a rising agricultural town, near Beverley. The person who signs himself "Architect" being in reality a cabinet-maker, no doubt his clients will also give him the work to fit up their bedsteads, blinds, &c. Now, is not this a disgrace to the profession, and future ruin to architects? Surely it is high time that the Architectural Societies should do something at once to prevent such business being done. Why could not the Institute, for instance, grant every professional architect in practice some title on his proving his right to have the same, and so make a proper distinction? I am quite sure that every fellow-architect will bear me out that to have some protection is what is very much wanted at the present time. Let us pay one guinea per annum to some society for the purpose of paying expenses of the same, and the balance to go towards the "Architects' Convalescent Home," for I am quite sure we shall soon require one. I suppose in the next century will be seen a sign with "Brown, Architect and Hairdresser," or "Brush Maker," &c., on it.—I am, &c.,

Justice.

[We are not sure that our correspondent, who hails from Hull, knows what he is writing about. In the first place, the matter he complains of has been complained of before again and again. And then let us ask what if the Institute or any architectural society were to grant a diploma to every professional architect in practice? Would that prevent any builder or cabinet-maker styling himself an "architect" if he thought proper? We suppose that "Justice" means that it should be made illegal for any one to call himself an architect who is not qualified by special education for professional practice. But to obtain such a result an Act of Parliament is necessary, and we cannot very well get an Act of Parliament, or we ought not, at all events, without the assistance and sanction of public opinion, and it is not likely that public opinion will confer any more exclusive parliamentary privileges on any profession. If architects obtained such a protection, why should not civil engineers, and if civil engineers, why not ship-builders, and if ship-builders, why not house-builders? Voluntary trades' unions are bad enough, or architects, as a rule, think so; but professional unions, created by Government action, would be worse. What is wanted most is not a law-manufactured diploma, but a higher moral action on the part of architects to act honourably one towards the other. In the absence of such moral action, legal protection and privilege would be useless. Besides, why should not a builder, or a cabinet-maker, or a stone-mason design and superintend the erection of a stable, or a mill, or a cathedral, if he possesses the requisite capabilities? Does "Justice" mean to deny that we have some builders better qualified to do these things than some of our architects? A special education does not necessarily qualify a man for special artistic work, or, if so, why have we so many specimens of spurious architecture, designed by specially-trained architects, staring us in the face? We could show "Justice" specimens of architecture which respectable builders would be ashamed to acknowledge as their own designs; and we could show him other and superior buildings erected without architectural superintendence. Besides, is "Justice" aware that his policy would have excluded such men as Christopher Wren and Michael Angelo from the list of architects?—Ed.]

SCHOOL PLANNING COMPETITION.

Sir,—Your correspondent "H." has utterly failed in proving the theory he holds as to the lighting of schools, and the architect of the S. Austell Schools (who I may say is a stranger to me), as well as others who have lighted their rooms with windows at the backs of the children, have just cause to complain at the slur that has been cast upon them, and "H.," instead of satisfactorily answering the plain question as to which is the best way of lighting a school when the windows can only be obtained on one side, ignores the question altogether, and cuts the Gordian knot by propounding a new theory of his own—that of lighting from the top, a system that I venture to say is most gloomy and quite unfitted for any apartments occupied by children, except for the few moments that may be devoted to the study of drawing; and moreover, in the case of buildings of more than one story, top lighting would be altogether inapplicable.

It is undignified of "H." to say that "it is a matter of indifference how schools are lighted in romantic Cornwall." I think your readers will agree with me that whether schools are in Cornwall or Middlesex their construction and appointments should be equally well studied, and after the authoritative tone your correspondent has adopted he might fairly have been expected to support his theory on a more solid basis than he has brought forward, and one that should have carried conviction to your readers. I should be very glad to have the opinion of one in authority as to this vexed question of lighting, but until some more satisfactory solution of the question is brought forward I shall still follow the example of many eminent architects, and light chools with windows at the backs of the children, snd where it is practicable introduce a left-hand side aght also.—I am, &c.,

T. P.

"THE OLD STORY."

Sir,—Referring to my letter under this head, which appeared in the Building News of the 17th May last, I have, since writing the same, found that it was not justified by the facts. The successful candidate in the competition has, I am informed, gained the prize through the merit of his design, and not through having friends among the adjudicators. I apologise for any unintentional injury done to him.—I am, &c.,

Indignant Observer.

NORTHERN NIGGARDLINESS.

Sir,—As I think the abominable niggardliness of committees. &c., should be exposed, I enclose you, for insertion in you next issue, a specimen of the liberality of the Stockton-on-Tees Exchange Company, who wish to obtain drawings in competition for their new buildings, and propose to make the competitors pay the expenses of plan of site, &c., by charging them 10s. each for same. They do not even give you a copy of the conditions (which one might not approve), but they lay in their advertisement what, probably, they consider the tempting bait of £50, £25, and £10 premiums. (A consulting architect would have done them much better service.) It is to be hoped that these gentlemen will be left out in the cold, and that those who support such a system (I was going to say of attempted extortion, but call it by some other name), may, together with the directors, meet with the reward they so richly merit.—I am, &c.,

Brains and Capital.

Birmingham.

Copy of Memorandum.

FROM THE SECRETARY, STOCKTON EXCHANGE COMPANY, LIMITED, STOCKTON-ON-TEES.

On the receipt of 10s. I can forward you a tracing showing the outline of the ground. The bank and post-office are intended to be the principal front of the building in High-street, and the hotel and club rooms at the back, facing West-row, and the public exchange in an intermediate situation. The offices and cellarage are left for the consideration of the architect.

SUNDERLAND SCHOOL BOARD.

Sir,—I enclose you conditions for the above competition. It is to be hoped that no honourable professional man will compete for the above unless the italicised clause in the conditions be struck out; in fact it is an insult to the profession. Note also the liberality of the premiums.—I am, &c.,

24, Park-square, Leeds, Ridley King.
July 31, 1872.

[*Copy.*]

The School Board of the District of Sunderland.—Sunderland School Board: Instructions to Architects.—The School Board of Sunderland require a plan with sections and elevations for School Buildings to accommodate 1,050 children (350 boys, 350 girls, and 350 infants), to comprise six class-rooms—two for the boys, two for the girls, and two for the infants—each room to accommodate about an eighth of the respective numbers; a small private room in each school. The whole must be in conformity with the requirements of the Education Department. A plan and levels of the site will be supplied to competitors. No access to Burdon-lane (on east side) allowed. The buildings to be of brick, relieved with stone dressings, plain and substantial. Drains to be laid and connected to corporation sewers. The drawings to be to a scale of 8ft. to an inch. The plans and section to be coloured with no other colours than Indian ink or sepia. The elevation to have no colouring whatever. No perspective, isometrical, or bird's eye views allowed. An estimate of the cost and specification to accompany each design. *The three designs selected for prizes to become the absolute property of the School Board, and to be used by them or not as they think fit.* Each design to be distinguished by a motto, the author's name and address to be enclosed in a sealed envelope, superscribed with his motto, and both to be addressed to Mr. T. C. McKenzie, solicitor, clerk to the Sunderland School Board, not later than Monday, 2nd September next, at 10 a.m., and endorsed, "Design for Schools." The premiums to be—for the best design, £20; second, £10; third, £5.—Thos. C. McKenzie, clerk to the board.—Sunderland, July 27, 1872.

CO-OPERATIVE JOINT STOCK BUILDINGS COMPANY.

Sir,—It appears to me that one of the best remedies for the existing state of the building fraternity (?) would be the merging of all existing establishments into co-operative joint stock companies. During the last twelve months 50 millions sterling have been invested in companies, and still it is the order of the day, and will continue to be, for companies manage undertakings much more systematically than individuals do, or we should not have the shameful discrepancy we do in contractors' tenders. A company formed upon the following basis could not possibly fail:—

"The Co-operative Contracting Company (Limited). Capital £100,000 in 10,000 shares of £10 each. Payments, 5s. on application, 15s. on allotment, the remainder as required. *Prospectus:* Any mechanic subscribing 10 shares, and any labourer 5 shares, will have employment guaranteed at 7d. per hour for the former in London, and 3½d. for the latter. These wages will be regarded as capital, and be supplemented at the same rate as capital every three months, as the profits will allow. Thus, if the wages during the three months amount to £20,000, and the paid-up capital to another £20,000, and the profits amounted to £1,000 during the three months, or 25 per cent. upon £40,000, the wages would be supplemented by a bonus of £4 16s. 8½d., or make the wages equal to 8¾d. per hour."

Of course, all the shareholders must in such company be workmen, or otherwise employed in the firm. It would not be wise to purchase or rent large premises in expensive cities, or lay out an enormous capital in building, as the West Central Waggon Company has done; a contractor's premises may be anywhere so that they be near a canal or railway. Many suggestions have been offered to remedy this great evil of the age, but none have offered such a practical one as the above, and the writer would be glad to assist in the formation of such a company.—I am, &c., Action.

THE GAIETY HOTEL AND RESTAURANT.

Sir,—In your last issue mention is made of the new buildings now in course of erection in Catherine-street as connecting the theatre with the restaurant, whereas they have nothing at all to do with the theatre, which has always been connected with the restaurant, although under entirely distinct management. You also state "that the Gaiety Theatre was originally opened as the Strand Music Hall," which is not the case. The Strand Music Hall was pulled down and the Gaiety Theatre built on the site.—I am, &c., C. J. Phipps, F.S.A.

Intercommunication.

QUESTIONS.

[2617.]—**Varnishing Chimney-Pieces.**—Disliking paint for good stone chimney-pieces, I should like to know what kind of varnish would be the most suitable to put a nice glaze on the surface, so as still to retain the colour of the freestone. Should any composition be laid on before the varnish?—J. B.

[2618.]—**Steam Engines on Roads.**—The Act which regulates the above says: "Subject to the provision of this Act, engines under 14 tons weight may travel on the highways by making good all damages to bridges, &c." Will a culvert or flat-topped bridge, 4ft. wide, come within the meaning of this Act? and can any cases be quoted where the owners of such engines have had to pay such damages?—J. B. Rusticus.

REPLIES.

[2609.]—**Plaster.**—If there be any salt in the sand used for plaster, a white efflorescence will soon appear on the surface of the wall, &c., and this efflorescence will have a decided taste of salt. The best mode of ascertaining if there be any salt in the sand to be used is to take a few grains up on a moist piece of platinum wire and expose them to the flame of a Bunsen burner. If the smallest quantity of salt be present, a decided yellow flame will be the result, showing the presence of sodium (or salt). Care must be taken to wipe the wire clean before using, for if you simply pass it through your fingers it will take up the sodium from the skin.—J. T. J.

[2609.]—**Plaster.**—Plaster made with sea sand is liable to be affected by changes of weather, owing to the absorption of water by the saline particles. This, of course, causes the rooms so plastered to be damp in certain seasons, and often leads to the destruction of the wall-papers. If the lime used is hydraulic, the resultant plaster or stucco is benefitted rather than otherwise by the sea sand, as the set is improved by the presence of moisture. With a pure or fat lime, however, sea sand is very objectionable. I can think of no readier mode of testing the sand than to suggest that "Anxious" should wash some of it in spring water, and after allowing the water to settle, pour it off the sand and evaporate it to dryness in a saucepan or pipkin. If the salt is present in sufficient quantities to be injurious, it will be deposited in the form of an incrustation at the bottom of the vessel.—Gilbert R. Redgrave.

[2615.]—**Room for Valuable Papers.**—Should "ground floor" mean a "basement floor," the thoroughly dry appearance of the pavement of stone laid upon concrete may be deceptive, and moisture may arise to affect the papers deposited in the room. I would, failing to trace the cause of dampness to my satisfaction, take up the stone pavement and apply Claridge's asphalte, and that of the quality used for flat roofs.—M. S.

PARLIAMENTARY NOTES.

The Metropolitan Board.—Mr. Bruce having declined on Monday to give any answer to Sir C. Dilke as to whether Government next session could undertake to bring in a Bill dealing with the Government of London or the election of the Metropolitan Board, Mr. Goldsmid, in reply to the hon. baronet, said that he intended, in the event of the Government not doing so, to introduce a measure for the direct election of the Board by the ratepayers.

Children in the Brickfields.—The Earl of Shaftesbury moved, on Thursday week, in the House of Lords, for a return of the number and names of the officers appointed to inspect the brickfields in Leicestershire, Staffordshire, and Warwickshire under the Workshops Act, with the number of visits made by them to the brickfields during the past twelve months. The noble earl said that in the districts referred to, as well as in other parts of the country, the Act, as far as it referred to brickfields, was at present a dead letter on account of the absence of inspectors to put it in operation, though the blame was not to be attributed to them, their number not being sufficient for the heavy and increased duties that had been thrown upon them. In other parts of the land, such as Kent and the home counties, where the inspection had been adequate, the happiest results had followed from the Act. He hoped that the number of inspectors would soon be increased, and that care would be taken to select men fully competent for their duties.—The Earl of Morley said that he had no objection to the motion of the noble earl. It must be remembered that the Act had not as yet been really in operation in the brickfields more than three months, and it was not therefore surprising if it did not yet accomplish all that was expected of it. He might also say that if it should be found necessary, in consequence of the increased duties thrown upon the inspectors, to increase their number, it would be done.—The motion was then amended so as to include some other districts in which there were brickfields, and as amended was agreed to.

King-street, Westminster.—In the House of Commons, in answer to Mr. W. H. Smith, Mr. Ayrton said the roadway of King-street, Westminster, appropriated as part of the site for new public offices, had been closed under an Act passed in 1866. Any persons injured by the closing of the road would be entitled to claim compensation for the injury, but no such claim had been put in on the part of any one.

Opening Museums on Sundays.—In reply to Mr. Torrens, Mr. Forster on Tuesday said that the Government were not prepared to open the Museums at South Kensington and Bethnal Green on Sundays. If they did, all other museums must also be opened, and this would involve a complete change in the policy of the country. No doubt strong opinions were felt on both sides of this question; for whilst 26,000 had petitioned for the opening of the British Museum, 620,000 had petitioned against it. Whatever were their individual opinions, Government would not act in this matter unless they had reasons to believe they would be supported by public opinion.

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LEGAL INTELLIGENCE.

The Birmingham Sewage Nuisance.—Attorney-General v. Council of Borough of Birmingham.—This was a motion before V.C. Sir J. Bacon, on Saturday, for a sequestration against the Corporation of Birmingham on an information by four inhabitants of the borough for an injunction restraining the Corporation from continuing a certain nuisance arising from the sewerage tanks and farm of the Borough at Saltley. The injunction was granted so long ago as March 10, 1871. An unsuccessful application was afterwards made on the 25th January, 1872, for an extension of the time for complying with the injunction. That application was dismissed with costs. Since then the Corporation had neglected to do anything towards complying with the injunction, and were charged with evading compliance with it. The nuisance was now become so much aggravated as to threaten an epidemic. Under these circumstances the present application was made.—His Honour, at the conclusion of the arguments in this case, decided that the defendants had not obeyed the order of the Court as to the nuisance occasioned by the sewage of the town, and therefore ordered a sequestration to issue against the defendants, but its execution to be suspended until after the second seal day in Michaelmas Term, and ordered the defendants to pay the costs of the motion.

Storing Petroleum in the City.—At the Mansion House, on Tuesday last, M. Jules Lafrogne, of 17, Fish-street-hill, was charged before the Lord Mayor with having unlawfully, and in violation of the 7th section of the Petroleum Act of 1871, kept a quantity of petroleum at his premises.—Mr. John Fletcher Johnson, one of the officers appointed by the Court of Aldermen to carry out the provisions of the Act, stated that on the 3rd of July he found on the defendant's premises, in a cupboard under the stairs, an iron drum containing ten gallons and a can of eight gallons of petroleum, which gave off an inflammable vapour at 66 degrees, being only one degree less than the temperature of the premises. He accordingly seized that quantity.—The defendant pleaded guilty to the charge, but said he was ignorant of the law.—The Lord Mayor told the defendant that he was liable to a fine of £20 for each day he had kept the petroleum, but, fortunately for him, the information only mentioned one day. He had committed a very serious offence, and he fined him £20. The petroleum must be confiscated. The fine was paid.

The Planet Benefit Building Society.—The Master of the Rolls resumed on Tuesday the hearing of a petition by a member of the Planet Benefit Building and Investment Society, praying that, on the ground of insolvency, it might be ordered to be wound up.—The Solicitor-General, Mr. Fry, and Mr. Whitehorne were counsel for the petitioner.—Mr. J. Napier Higgins, who appeared for the Society, stated facts to show that the Society was solvent.—Mr. Roxburghe and several other counsel for members opposed the petition, which was ultimately dismissed, with costs.

Alleged Malicious Prosecution—Pugin v. Griggs.—Mr. E. Welby Pugin last year took up very warmly the case of a carpenter named Stevens, who had been convicted by the Ramsgate Magistrates of stealing broccoli from a garden; and in consequence of some accusations he had made against Mr. Griggs, the clerk to the Magistrates, in letters and printed placards, that gentlemen preferred a charge of libel against Mr. Pugin, and he was commited to take his trial at the Summer Assizes last year. The Grand Jury, however, ignored the two bills that were sent up to them. Last Friday, at the Maidstone Assizes, Mr. Pugin brought an action against Mr. Griggs for malicious prosecution. Baron Martin, at the close of the plaintiff's case, said it was clear to him that there was no evidence to go to the Jury to support the action. There was nothing to show malice, and the defendant had certainly had reasonable and probable cause for preferring the charge. The articles were clearly libellous, and he could not understand how it happened that the Grand Jury had not returned a true bill.

Architects' Duties and Liabilities.—James Soutar v. Alexander Gauld.—This case, recently decided in the Sheriff Court, Aberdeen, was an action in the Debts Recovery Court at the instance of the pursuer, architect in Aberdeen, against the defendant, flesher, in Aberdeen, for payment of £12 10s., commission, at the rate of 5 per cent., on the erection of a cottage for the defender, the plans and specifications of which were prepared by the pursuer, who also superintended the works. The Sheriff-Substitute (Comrie-Thomson) found the defender entitled to a reduction of £3 8s. 6d. in respect that the pursuer had certified that the carpenter was entitled to full payment of his contract price before he had actually completed the work. The case was appealed, and the Sheriff-Principal has now pronounced the following interlocutor:—"Edinburgh, July 22, 1872.—The Sheriff having considered the pursuer's appeal, with the summons, note of pleas, proof, and productions: For the reasons stated by the Sheriff-Substitute dismisses the appeal, affirms the judgment of the Sheriff-Substitute, and discerns.—Signed, J. Guthrie Smith."

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A monument to Leonardo da Vinci is to be inaugurated at Milan in the course of the coming autumn.

The ancient parish church at Cheriton is about to be enlarged by a new aisle, and the roof restored. The tender of Mr. Bowley, Folkestone, for £1,568 17s. has been accepted; it was the lowest of seven received.

The foundation stone of a new Wesleyan Chapel was laid at Brereton on the 15th ult. Mr: Joyce, of Stafford, is the architect.

The foundation stone of the Franciscan Missionary Convent was laid at Mill Hill, on Wednesday week. Mr. Goldie is the architect. The convent will contain cells for 50 sisters.

A new Congregational School Chapel was opened at Sale on Sunday week. Mr. Wynstanley, of Sale, is the builder. The cost has been about £500.

The King of the Belgians has conferred on Professor Donaldson the rank of Chevalier of the Order of Leopold; and the Ambassador has delivered to the Professor the Credentials and Cross of the Order.

The portion of the once famous Spalding Abbey which remains standing, and which has for many years been used as a dwelling house, is now undergoing thorough repair. There is little remaining to denote its antiquity, but what little there is will be preserved.

The Brighton Aquarium will be opened next week, in connection with the meeting of the British Association.

The Royal Scottish Academy has voted £50 towards the subscription being raised for the completion of the Scottish National Memorial to the Prince Consort, in Charlotte-square, Edinburgh.

A granite cross is about to be erected in Killerton Park, Devon, at the cost of several gentlemen of the county, in memory of the late Sir Thomas Dyke Acland.

Our Office Table.

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A Speculative Builder.—The case of Edward Vigers, described as of Elgin Lodge, Harrow-road, builder, brickmaker, and dealer in land, and residing at Tavistock Lodge, Upper Westbourne-park, came before Mr. Registrar Murray at the Bankruptcy Court lately. The debtor had presented a petition for liquidation, and last week the court appointed Mr. Sydney Smith, public accountant, receiver of the estate, and granted an interim injunction restraining further proceedings at the suit of creditors. The liabilities amounted to no less than £140,000, and the estate—which showed a surplus subject to realisation—consisted principally of the debtor's interest in various valuable building agreements, and the surplus value of real and leasehold property beyond the mortgages thereon. Mr. F. Knight, on behalf of the debtor and receiver of the estate, asked for an extension of the interim injunction until the further order of the court. His honour extended the injunction until after the meeting of creditors, which is appointed for the 8th of August, to be held at the Terminus Hotel, Cannon-street.

Edinburgh Royal Association for the Promotion of the Fine Arts.—The annual general meeting of this Association was held in the Queen-street Hall on Saturday afternoon last. The Chairman, Professor Douglas Maclagan, stated that since the foundation of the Association, no less than £130,000 had been expended in the direct encouragement of the Fine Arts. Of that sum, upwards of £81,000 had been spent in the purchase of pictures and statuary; £40,000 in the procuring and diffusing of engravings of a high class; and upwards of £3,000 in the purchase of works to be deposited in the Scottish National Gallery.

Ventilation of Schools.—The horrors which children often have to endure in private schools, owing to the absence of any proper system of ventilation, are, it is to be feared, very great. Speaking of private adventure schools," Mr. Bowstead, her Majesty's inspector, in his general report for last year on schools inspected by him in the county of Gloucester, which has just been printed, says that he and his colleague, Mr. Kenny, have visited a great number of them, especially in Bristol, and have found only two or three that have any reasonable pretensions to be regarded as efficient. It is not that the rest are all under the charge of ignorant or incompetent teachers; it is rather that the premises in which they are carried on are altogether unsuited for the purpose. The rooms are generally low, incapable of ventilation, and so small as to afford a mere fraction of the cubical space required for the number of children ordinarily attending in them. Most of them are common living rooms without desks, and with very little other accommodation for writing. They have seldom any outlets or any proper offices. In one school of this kind, which was situated in a country village, and which Messrs. Bowstead & Kenny visited with the clergyman of the parish, they found thirty-two children crammed into a room about 10ft. square, and so low that Mr. Bowstead, even with his hat off, could not stand upright without risking a collision between the beams and his head. The atmosphere was unbearable, and it is difficult, adds Mr. Bowstead, to understand how the children remained healthy. If they have been confined in this black-hole during the late hot weather, death has probably before now put an end to their education and sufferings.

Oxy-Hydrogen Street Lamps.—Within the last few weeks the New York Oxygen Gas Company has extended its operations. An American authority says:—The light is presented in the form of intense white tufts of flame, which burn very steadily and yield most brilliant illumination, imparting a cheerful radiance to every object in the neighbourhood, bringing out the natural colours almost like sunlight. The company is now in readiness, we understand, to contract for the lighting of all the streets by this method. We need hardly say that its general introduction for this purpose would be a great public improvement. Our streets, thus lighted, would be rendered attractive and safe. Men who love darkness because their deeds are evil would have to emigrate to places where oxygen lights were unknown. A single jet of the new light is alleged to be equal in illuminating power to sixteen of the ordinary street gas jets. When the two lights are placed side by side, the common gas flame looks exceedingly poor and dingy.

Death of Dr. Aldis.—The death is announced of Dr. C. J. B. Aldis, an efficient and painstaking officer of health, whose name is familiar for his reports as to the sanitary condition of S. George's, Hanover-square.

CHIPS.

In our report last week of the annual meeting of the Builders' Benevolent Institution, we omitted to mention that while the accounts showed an increase in the amount paid to pensioners, the working expenses of the institution had decreased.

In reference to the announcement in our last as to the retirement of Mr. Henry Cole, C.B., from the post of General Superintendent of the South Kensington Museum, it is stated that Mr. Cole will "continue his services to art and science in connection with the annual scheme of international exhibitions."

A correspondent of the *Guardian*, whose ancestors were buried in one of the old City churches, asks the very pertinent question—"What has become of the monuments which stood in those lately pulled down?" Can any of our readers tell?

A legacy of £5,000 has just been left towards the restoration of Salisbury Cathedral, and donations have been given for the erection of three additional statues on the west front.

A new Wesleyan Sunday School is being erected at Undercliffe, near Bradford, at a cost of £600, to accommodate 500 scholars. It is 60ft. long by 33ft. wide and 30ft. high internally. Messrs. Gelder & Daggett, of Undercliffe, are the contractors.

It is proposed to erect a New Free Library at Galashiels, N.B. Subscriptions to the amount of £1,772 have been received; an effort will be made to raise the subscriptions to £2,500.

The Metropolitan Board of Works have agreed to contribute one half the cost of the improvement at Paul's Wharf, proposed to be effected by widening the public way at an estimated cost of £605, by the Commissioners of Sewers of the City of London.

The erection of the administrative block at S. Luke's was the subject of another debate on Wednesday week at the Holborn Board of Guardians. A motion to delay the works till the dispute in the building trade had been finally arranged was carried by a narrow majority. The architect gives it as his opinion that delay is dangerous, for next year the men will make a further demand, and no doubt will get it.

The Metropolitan Board of Works have decided to open three new fire-engine stations, one in the Farringdon-road, another in the Mile-end-road, and a third at the corner of Heath-street, Hampstead. A fourth station is contemplated at Battersea.

A medical contemporary notices that it is high time that the Metropolitan Board of Works should pay some attention to the creek at Hammersmith, which, in its present state, is nothing better than a "pestiferous open sewer."

Mahogany wood has been discovered in the Guinea region of Africa.

At the annual meeting of the Institution of Mechanical Engineers, held in Liverpool on Tuesday, the chairman announced that the next meeting would be held in Birmingham, and that a building for the purposes of the institution was about to be erected in the same town at a cost of £12,000.

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Trade News.

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WAGES MOVEMENT.

LONDON.—The dispute seems to be finally resolving itself into the ordinary trade question of pounds, shillings, and pence. It was hoped that Wednesday's "interviewing" would have terminated the strife, but the long parleying of masters and men ended in nothing. On Friday last it was arranged that a meeting should be held on Wednesday, of the sub-committee of the Central Association of Master Builders and the Amalgamated Building Trades Committee, each furnished with full powers to discuss, and, if possible, to settle two points, viz:—1. Whether any variation in the working hours could be settled to give equal advantages to the other trades without disturbing the arrangements made with the masons. 2. Whether any mutually satisfactory arrangement could be made for establishing a code of working rules. The carpenters and joiners, however, threw over the Amalgamated Committee and resolved upon sending an independent deputation of their own, tied down to what is termed "the nine hours pure and simple" at 8½d. the hour up to the 1st of March next, and after that date 9d. the hour, with a code of working rules to be settled by arbitration, the men to continue out until such code could be arranged. The deputation appointed to carry out this mission presented themselves in due course to the sub-committee of the Masters Association, by whom they were courteously received; but it became their unpleasant duty to explain that the terms of the resolutions referred to precluded all discussion. They were empowered to treat even to the extent of granting the coveted "nine hours and ninepence;" but the two gentlemen coming from the carpenters and joiners had their hands completely tied up, and all negotiation on the previously arranged basis was therefore cut off. Later on came the surviving members of the Amalgamated Building Trades Committee. The first point fixed for discussion was broached, when it was discovered that the representatives of the bricklayers were in the same unfortunate situation as those of the carpenters and joiners, being restricted to 51 hours per week all the year round, at 8½d. The money had already been conceded by the employers, but the same reason that precluded the sub-committee entertaining the proposals of the carpenters and joiners forbade their listening to the bricklayers' delegates. Then ensued a wordy contest as to whether the division of times put forth by the Amalgamated Committee, of 14 weeks in winter at 48½ hours per week, and 38 weeks in summer at 52 hours, would be more useful or advantageous to the trade than the twelve winter weeks of 47 hours per week and the forty summer weeks at 52½ hours per week arranged by the employers with the masons. The sub-committee, it may be concluded, without the candid admission of the men, gave the fullest attention and consideration to the arguments ably advanced in justification of their appeal to have the hours extended in winter; but they eventually arrived at the conclusion that no case had been made out for a departure from their own division of time, although if the workmen desired to compensate their money loss by working more hours they were ready to add fifty-two to the working hours by consenting to the leaving-off hour being fixed on Saturday at 1 instead of 12 p.m., as in the case of the masons. The only result that appears to have attended this lengthened interview is the understood determination of the employers to make the same concession to building labourers as to the other branches, so far as their pay is concerned. They memorialised for an advance, like the others, of a penny per hour, and, like the rest, they are to be met half-way, and receive an additional halfpenny. The deputation from the carpenters and joiners, after their interview, hurried back to the Brown Bear Tavern, where they reported to the members of the Central Committee present the nature of the reception they had met. The members finding they were sufficient in number to constitute a quorum forthwith proceeded to make the requisite preparations for renewed appeal to the support of the country and the metropolis. Messrs. Benny and Burgess, who are looking up the principal towns of Lancashire and its borders, report the continued success of their mission; and on Wednesday night two delegates attended a public meeting of the trade at Richmond, in Surrey, at which resolutions were passed to render material help to the strike. On the other hand the masters exhibit an equally firm attitude, and there are whispers that unless the carpenters and joiners display a more ready disposition to arrange matters, another lock-out may become necessary.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

ASTON.—For the erection of infirmary to Aston Union Workhouse, near Birmingham. Mr. Yeoville Thomason, architect:—

Smith	£11034
Matthews	10880
Everal	9955
Bennett	9740
Parnell & Son	9458
Jones	9280
Barnsley & Sons	9276
Cresswell & Sons	9227
Jeffrey & Pritchard	9065
Garlick (accepted)	8648

CARDIGANSHIRE.—For rebuilding the parish church of Ysputty Ystwith, Cardiganshire. Mr. Withers, architect:—

	Church.	Tower.
	£	£
Williams	850	170
Jones & Sons	725	140

EAST ACTON.—For conservatory and vinery works at "The Lodge." Messrs. Hutchins & Ogden, surveyors, 28, S. Swithin's lane:—

Weeks & Co.	£500	0	0
Rumsey	363	16	3
Harris & Wardrop	319	0	0

EAST SHEEN.—For the erection of a gentleman's residence at East Sheen. Quantities by Mr. Gandy. Mr. E. Ingress Bell, architect:—

Simpson	£4830
Turner	4422
Henshaw	4348
Gibb	4207
Higgs	4180
Sharpington & Cole (accepted)	3979

EAST YORKS.—For the erection of Congregational Church, Hornsea, East Yorks. Mr. Samuel Musgrave, architect:—

Hulke & Stephenson (bricklayers)	£850	10	6
H. & W. K. Pitts (carpenters)	[illegible]	5	0
Denton (mason)	586	19	6
Jas. Barr (plumber, glazier, gas-fitter, and painter)	165	0	0
[illegible] & Son (slaters)	79	0	0
King & Co. (ironfounders)	11	0	0

(All the above tenders were accepted.)

HULL.—For the erection of Congregational Church in [illegible]-street, Hull. Mr. S. Musgrave, architect:—

Musgrave & Son (bricklayers)	£625	0	0
Raven (joiner)	698	0	0
Walker (mason)	[illegible]	0	0
[illegible] (plumber, glazier, and gas-fitter)	138	0	0
King & Co. (ironfounders)	12	0	0
[illegible] & Son (slaters)	97	4	6
Wright (painter)	17	15	0

(All the above tenders were accepted.)

KENT.—For the erection of stables, &c., at Beckenham, Kent, for Captain Scott, R.N. Mr. W. C. Banks, architect:—

Stimpson & Co.	£425	0	0
Carmody	393	17	0
Grubb	385	0	0

LEEDS.—For the erection of a house and business premises, Leeds. Mr. Samuel Musgrave, architect:—

Pawson	£2287	0	0
Thorpe	2249	15	0
Britton	2248	12	0
Longley Brothers	2232	0	0
Whiteley	2182	10	0
Oakes & Son (accepted)	2150	0	0

LEICESTERSHIRE.—For the erection of vicarage house, &c., at Hinckley, Leicestershire. Mr. William Wigginton, architect:—

Forster	£1722	0	0
T. & G. Harrold	1623	0	0
J. & W. Harrold (accepted)	1438	5	10

LEWISHAM.—For alterations at Southend Mills, Lewisham, for Messrs. Ellis. Mr. W. C. Banks, architect:—

Hubble	£497
Stimpson & Co.	495
Grubb	439

LISKEARD (Cornwall).—For the erection of proposed Masonic Hall, adjoining the Devon and Cornwall Bank, on the Parade, Liskeard. Mr. Jno. Paul, Torquay, architect:—

Trehane & Short	£1180	0	0
Lapthorne & Goad	1050	10	0
Sargent	993	0	0
Lang	880	0	0
Bone & Son	874	0	0

LONDON.—For warehouse, &c., Ely-place and Charterhouse-street, Holborn. Mr. Wm. Wigginton, architect:—

Merritt & Ashby	£2857
Axford & Whillier	2600
Kent	2511
Eaton & Chapman	2351
Heath	2293
Falkner (accepted)	2112

LONDON.—For alterations to S. Mark's Schools, Old-street, London. Mr. Wm. Wigginton, architect:—

Henshaw (accepted)	£275

LONDON.—For the erection of Parochial Institution for S. Mark's, North Audley-street, George-street, Oxford-street, London. Mr. Withers, architect:—

Allen & Sons	£4483

LONDON.—For the erection of S. Michael and All Angels' Vicarage, London Fields, Hackney, London, E. Mr. Wm. Wigginton, architect:—

Hill, Keddell, & Waldram	£3107
Hill & Sons	3053
Killby	3015
Heath	2915
Falkner	2898
Merritt & Ashby	2851

LONDON.—For the erection of stable, &c., at Blackfriars, London, for Messrs. Spiers & Pond. Quantities supplied:—

Avis	£3650
Adamson	3649
Manley & Rogers	3581
Tulley	3450
Bracher & Son	3305
Trevena	3299
Oliver	3200
Henshaw	3179

LONDON.—For alterations to workhouse of the Westminster Union, Poland-street, Oxford-street. Mr. E. R. Blatchley, architect:—

Warne & Son	£1459	0	0
Harding	1375	0	0
Simpson	1260	0	0
Cook	1250	0	0
Copp	1169	12	10

NUNEATON.—For alterations and additional machinery at the sewage works, for the General Sewage and Manure Company Limited. Mr. Henry S. Copland, engineer:—

May & Mountain (accepted)	£606	10

PORTMADOC.—For the erection of a wooden pavilion for holding "Eisteddfod Gadeiriol Eryri" and North Wales Musical Festival. Messrs. Roberts & Morrow, architects:—

Morgan	£320
Lloyd & Co.	299
Griffith	292
Owen Griffith	275
Williams	220
Roberts (accepted)	205

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COMPETITIONS OPEN.

Batley, August 15.—For plans for setting out a close of land adjoining the Public Hall. Premiums of £25 for the best, and £10 for the second best designs. —Mr. Thomas Dean, Town Clerk, Batley.

City of London, September 5.—For designs and tenders for the execution of a medal, to be struck as a memorial of the late National Demonstration on the visit of Her Majesty to the City on the Thanksgiving Day. Woodthorpe, Guildhall.

Grays Thurrock (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

Stockton, August 17.—For designs and estimates for a public exchange, hotel, bank, post and telegraph-office, club-room, sale-room, general offices, and cellarage. Premiums—£50 for the best, £25 for the second, and £10 for the third best designs.—Mr. J. Settle, Secretary to the Stockton Exchange Company, Stockton-upon-Tees.

Sunderland School Board, September 2.—For plans and elevations for school buildings to be erected in James Williams-street. Premiums of £20 for the best, £10 for the second best, and £5 for the third best designs.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

Watford, August 17.—For designs and estimates for a building to be used as a Public Library. Premiums of £21 for the best, and £10 10s. for the second best design.—Rev. Newton Price, Belmont House, near the station, Watford.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Acton Local Board, Aug. 13.—For the supply of 500 tons of granite, syenite, or any other hard and suitable road stone.—E. Monson, E.C., Surveyor to the Board, High-street, Acton.

Barnard Castle, August 8.—For the proposed alteration and extension of Wesleyan Chapel. Jos. Potts and Son, architect, Sunderland.

Bowes, August 7.—For the alteration and enlargement of Bowes Vicarage. Giles and Gane, architect, 7, Furnival's Inn Holborn, London.

Brighton, August 12.—For the completion of the Brighton Intercepting and Outfall Sewers.—Mr. F. J. Tillstone, Clerk to the Board, Town Hall, Brighton.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

Burnley, August 5.—For the erection of a new grammar school.—Robert Handley, Clerk to the Trustees, Burnley.

Canterbury, September 2.—For proposals from persons or companies willing to accept a concession of sewage for a term of years.—Mr. R. W. Flint, Clerk to the Local Board, Canterbury.

Cheltenham, August 15.—For the erection of the Delancey Fever Hospital.—Messrs. Middleton & Goodman, Architects, Cheltenham.

Croydon School Board, August 5.—For the erection of schools and teachers' houses in Bynes-road. —Mr. J. Berney, Architect, 61, North End, Croydon.

Crystal Palace Park Estate, August 12.—For the erection of a house on Plot 6.—Mr. J. Norton, Architect, 24, Old Bond-street, W.

Edgeware, August 19.—For the supply of Guernsey granite or other hard stone, also double-screened gravel, and surface hand-picked flints.—Mr. W. A. Tootell, Clerk to the Highway Board, Court House, Edgeware.

Fraserburgh (Scotland), August 20.—For the erection of a quay wall, and the deepening of the North and South Harbours.—Mr. Southerland, Clerk to the Harbour Commissioners, Fraserburgh.

Great Western Railway, August 13.—For the construction of a goods-shed at Stratford-on-Avon.—Mr. F. G. Saunders, Paddington Station.

Halifax Infirmary, Aug. 15.—Tenders are required for additions and alterations. — Mr. William Bakewell, Architect.

Halifax, Aug. 17. — For semi-detached Villas, Saville Park Road, Halifax.—Mr. William Bakewell, Architect.

Hampton (near Evesham), August 12.—For the erection of a new school and teachers' residence.—Mr. G. Hunt, Architect, Evesham.

Haulbowline (Cork Harbour, Ireland), August 7. —For the supply of Baltic timber and plank.—Director of Works Department, Admiralty.

Kidderminster, August 5.—For the construction of covered tanks, engine-house, boiler-house, chimney-shaft, and other works at the Borough Sewerage Works.—Mr. J. Morton, Clerk to Local Board, Kidderminster.

Leeds, Aug. 5.—For the erection of twelve houses in South Brooke-street.—Mr. George Corson, architect, Cookridge-street, Leeds.

Leeds, Aug. 5.—For the erection of Armley Brewery.—Mr. William Wilks, architect, 9, East Parade, Leeds.

Margate, August 5.—For the supply of 6,000 superficial feet of 2½in. best Yorkshire paving.—Mr. P. B. Coghlan, Borough Surveyor, 24, Harley-square, Margate.

Market Drayton, September 30.—For repairing the highways.—Mr. George Gordon Warren, Clerk to the Highway Board, Cheshire-street, Market Drayton.

Midland Railway, Aug. 6.—For the erection of New Station Buildings at Lillesthorpe, near Rugby. —Engineers' Office, Leicester Station.

Midland Railway, Aug. 6.—For the erection of Stables and other Buildings near the Passenger Station, Leicester.—Engineers' Office, Leicester Station.

Midland Railway, Aug. 6.—For the erection of stables and other buildings at Kentish Town.—Engineers' Office, S. Pancras Goods Station.

North Eastern Railway, August 6.—For the erection of a house and office, with men's cabin, at the New Coal Depots, Darlington; also a similar house, office, and cabin, and a goods weigh-office at Middlesboro; also for additions and alterations to the passenger station at South Stockton; and for the erection of a stable and additions to the goods warehouse at Guisborough.—Mr. J. E. Macnay, Secretary, Railway Offices, Darlington.

Old Shoreham (Sussex), August 10.—For the construction of an embankment against the River Adur, for reclaiming the Salterne—Mr. J. Ingram, Solicitor, Steyning, Sussex.

Oude and Rohilkund Railway, August 7.— For the supply of nineteen upper and lower class composite carriages, and ironwork for 100 covered goods waggons.—Mr. B. Leslie, 8, Victoria-chambers, S.W.

Reading, August 13.—For making and erecting water-power machinery at the Sewage Pumping Station.—Messrs. Lawson & Mansergh, 3, Westminster-chambers, S.W.

Redditch, August 12.—For a survey and plan of an enlarged district.—Mr. T. W. Baylis, Surveyor to the Local Board, Park-road, Redditch.

Rotherhithe, August 6.—For making-up the carriage-way and curbing and paving the footways of Raymouth-road.—Messrs. Hawks & Stokes, 61, Paradise-street, Rotherhithe.

Salisbury, August 7.—For the erection of new schools and offices in Milford-street.—John Harding, architect, 51, Canal, Salisbury.

South Shields School Board, August 12.— For the erection of the Ocean-road Schools.—Mr. T. Oliver, Architect, 66½, Northumberland-street, Newcastle-on-Tyne.

Southport Tramways Co., Aug, 12.—Contract No. 2—For 9,100 cubic feet pitch pine. Contract No. 3—For 18,300 superficial yards 4in. cube granite setts. Contract No. 4—For 46cwt. chilled cast iron points and crossings. Contract No. 5—For 230cwt. cast iron brackets. Contract No. 6—For 145cwt. wrought-iron dogs, bolt, nuts, and washers. Contract No. 7—For 14,500 compressed oak trenails. Contract No. 8—For the construction of about 4½ miles single line of street tramways.—Mr. C. H. Beloe, Engineer to the Company, 22, Lord-street, Liverpool.

Torquay Local Board of Health, August 13. —For designs and specification for a floating swimming bath, to be moored in Torbay.—Mr. B. Hooper, Clerk to the Board, Town Hall, Torquay.

Tottenham Local Board of Health, August 6. —For the construction of pipe sewers and ventilating shafts.—Mr. E. Crowne, Clerk to the Local Board, Tottenham.

Trinity House, Aug. 12.—For the removal of the present temporary Corton Low Lighthouse from Hopton, and re-erecting it at Kessingland, Suffolk.— R. Allen, Secretary, Trinity House, E.C.

War Department Contracts, August 7.—For the construction of new verandah roofs to the soldiers' quarters Royal Artillery Barracks, Aldershot.—Director of Contracts, War Office, Pall Mall, S.W.

War Department Contracts, August 7.—For the erection of a billiard-room at Salford Barracks.— Lieut.-Col. C. Akers, Royal Engineer Office, Manchester.

West Quantoxhead, August 12.—For the erection of the Rectory House.—Mr. J. Norton, Architect, 24, Old Bond-street, W.

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The "English Mechanic and World of Science," No. 384, published August 2, 1872, contains Articles on:— Ocean Circulation; Electro-Metallurgy.—IV.; Influence of Electricity on Liquids; The Watch, and How to Repair It; Artificial So-Called Organic Concretions; Historical Notes on Poisoning; The Manufacture of Textile Fabrics at Pompeii; Drawing from the Microscope; Notes of Communications to the Academy of Sciences, Paris; The Medicinal Use of Carbolic Acid; Mechanism; Hark Back!—B. A. C. Stars—and Star altitudes and Refraction; Sound (or Unsound) Theory; A Giant Planet; Reductions by *Nautical Almanac* Method and by Proportional Logarithms; The Gyroscope; Perspective; Upward Deflection of Bullets, &c.; Edible Mushrooms of Italy; The Harp; An Improved Beehive: Ligurian Bees; Co-Operative Stores; Artificial Manures; The Coming Struggle; Pigs, Rabbits, and Shell-Fish; Eyepieces; Heating by Hot Air; "Jack of All Trades;" New Material in Organ Building; Condensation of Steam in Pipes; Is the Moon Spherical?—To Mr. W. R Birt; Antiquity of Man; The Organ (Expression *A La Main*); Rotary Engine; Round Shoulders and Curved Spines; The Force of Gravity at or near to the Surface of the Earth; Centrifugal Force; The Bearing Rein; Reflection; Parallelogram of Forces; Draining Mines of Water; Judging Distances; Greatly Elongated Projectiles for Rifled Guns; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents, &c. Published at the Office of the Building News, 31, Tavistock-street, Covent-garden, W.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 9, 1872.

THE RECESS.

WE will endeavour to banish from our thoughts the work of the Session, summarised shortly in our last, with its modicum of successful attainments, and its shortcomings, and set ourselves to brace our energies and recruit our spirits with the relaxations incidental to the recess. To do this, however, it will not be necessary to ignore our profession altogether for the time being. As architects and artists we can roam forth, pencil and brush and sketch-books in hand, and endeavour to bring home with us some jottings which may prove useful in our future practice as well as pleasing reminiscences of our holiday. Whither shall we wend our way? It really matters little, so that we keep our eyes open to the beauties that Nature has bountifully spread around us, and to those objects of interest that the ancient masters of our craft have scattered with no niggard hand throughout the length and breadth of the land, and pretty widely in foreign countries. Only let us have some definite plan to work by, and not fritter away our precious time in desultory efforts and indecision. What do we individually need most? The study of form and proportion? Among the stately ruins of the Yorkshire Abbeys a few weeks would be spent to right good advantage. Do we want to exercise our hands with free sketching from the best examples of carved foliage, studied in the place it was designed for, with the attendant light and shade? Southwell Minster and a score of such glorious structures invite us to ransack their goodly stores. Would we note the varieties of towers and spires, and scan narrowly their outlines and groupings of pinnacles and lucarnes? Northamptonshire and Lincolnshire and the Fen districts await us with their rich store of examples. Would we brighten our ideas by studying the Mediæval specimens of polychromy, that have been clogged with modern Puritanic whitewash and yellow dab? Norfolk, with its painted screen-work, will well repay a search among its village churches. To collect and compare the mouldings of the same period in a particular district would be a profitable employment for one; to note the construction of ancient roofs, the method of joining their several timbers, and to mark how they have behaved under their centuries' experience, would be a most useful branch of study for another.

For those who can afford to be somewhat more ambitious in their rambles, France offers great attractions. But it is both expensive and comparatively useless to scamper over a large area and through many towns. Select one good centre, and work it well first. Take a city like Chartres, and become familiar with its Cathedral. It took centuries to build, and how can we expect to learn all its secrets in a day or two? What a store of archæological lore, of practical and artistic excellence, does it possess in its painted glass and the imagery upon its marvellous transept porches and western portals. Laon, Noyon, and Châlons-sur-Marne might each profitably be the scene for a fortnight's sojourn, and a subsequent ramble among the satellite churches in the neighbourhood of each of such luminaries would be more valuable than plunging at once into another locality equally renowned and equally rich, and driving the impression of one out of the mind by another.

The archæological societies' excursions, now so deservedly popular, are of use in bringing to notice under favourable auspices many objects of exceeding interest, and in rousing the attention of the owners to the treasures they haply have undervalued before. But, though some good occasionally is derived from the discussion of some problems connected with them among experts, the excursions are necessarily too hurried. The banquet is spread but to be removed, and the student who would profit by them should retrace his steps solitarily, and revisit the places which appeared to him to be worth careful consideration. By such means the first general glimpse gained in company will not have been thrown away, as without doubt, in nine cases out of ten, it practically is.

It is not, however, only old work which will repay the study which most of us can only give during the short recess. The modern works in most towns will repay careful criticism. They are even preferable to ancient buildings, in that they give examples of what to avoid as well as what to follow. They show actually worked out the difficult problems of meeting modern requirements and that economy which it is now-a-days necessary to study. New materials, new processes of manufacture and construction, are tentatively employed, and the intelligent student can hardly fail to learn much both from the successes and failures they exhibit. The examination is not so pleasing, and certainly need not altogether supersede the more delightful task of sketching and measuring from the earlier and more uniformly consistent buildings, erected when architecture was a living art, but notes of both classes can generally be made simultaneously, and the practice will be found a good one to initiate.

The recess being but short, and in a few weeks' time architects having to return to their more ordinary and humdrum occupations, and societies to recommence their meetings, it is incumbent upon those who are able to avail themselves of the general holiday time to make the most of the opportunity. We trust that the lighter labours we have sketched out for such will recruit the energies of individual members of the profession for the more arduous ones to which they must soon return, and tend to enliven their collective deliberations by a comparison of the notes made in some, at least, of the directions we have indicated.

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SIR R. WALLACE'S COLLECTION OF PORCELAIN AND POTTERY AT BETHNAL-GREEN MUSEUM.

THERE has never been so marvellous a collection of Sevrès and other porcelain or of furniture exhibited to the public, or, in fact, possessed by any single person, monarch, nobleman, or commoner, as that which Sir Richard Wallace has so nobly lent to the working men of London. By the attention which the most intelligent of the visitors to the Museum pay to the choicest works it is already certain that much good must come from the noble loan, and there is no telling of what importance it may very probably be in the development of the native talent of the country. It is scarcely likely that such vast sums as must have been spent upon some of the pieces will ever be spent again upon such things; but for all that, with our extra powers of machinery and mechanism, we may be able to produce works quite as admirable for workmanship and better in taste than much that was produced in the lavish times of the last century of the French monarchy. But it is not only in the finest French work that this extraordinary collection abounds. There is also a matchless selection of the finest specimens of Italian and other faïence and enamels. The late Marquis of Hertford had such practically unlimited means, such unexampled opportunities, and such excellent taste, or, at any rate, such perfect advice, that he got together an assemblage of art-work of the kind in which he delighted as never has been, and, in all human probability, never will be again collected. There is one very good reason why, till the state of Europe is altogether changed, such a collection cannot again be made, and that is, that it would probably cost many times the vast sums the late Marquis was able and willing to spend upon it. There are very many pieces in the present collection that, if it were known that they were for sale, all the richest Governments and all the richest people in Europe would compete for their possession.

The pottery begins from the early Spanish aud Persian—the former celebrated for its lustre, and, doubtless, the original of the Italian majolica. No. 1494, A and B, are good examples, as is also No. 1455, with Arab ornaments. The Persian faïence is of a very high class as respects the fine white of the glaze and its harmonious colours. The patterns, too, are chaste and simple, usually merely floral or geometrical, now and then relieved by conventional birds and other animals, and sometimes heightened with gold. This is the case with No. 1481. All the pieces of this pottery are worth observing. After these come the really fine art majolica ware of Italy, dating from the sixteenth century. This has been called Raphael ware, because he is said to have furnished designs for it. In the present collection there is one piece, No. 1412, described in the catalogue as a deep plate majolica of Caffagiolo, sixteenth century, painted with a dance of children, which is excellently painted, and is really after a design of Raphael that was engraved by Marc Antonio. There is one also said to be majolica of Urbino, with three female figures after Michael Angelo. As in most of the rest of the works of art shown here, the specimens are all choice, remarkable either for curiosity of design or excellence of colour, pattern, or drawing. For colour and lustre the Gubbio ware is the richest. Nos. 1493 and 1495 are typical examples. No. 1490 is a curious dish of what is called Sgraffiato ware, in which the pattern is engraved, and a glaze run over it. As interesting as any is No. 1448, a Castel Durante dish, the subject being a Virgin and Child of early style, with a Gothic letter inscription. Of the same ware is No. 1419, which should be noticed on account of the peculiarity of its ornamentation, the centre being sunk, and the pattern of oak leaves partly raised. We have only room to notice the following large and important pieces:—No. 1458, a very fine lustred dish of Gubbio; No. 1459, peculiar for an impressed ornament in white under the glaze; No. 1460, a dish of Castel Durante, painted by Nicolo d'Urbino, "The Marriage of Cupid and Psyche," after Raphael, with which may be compared a still finer dish, if possible, not signed, but probably by the same artist, No. 1469; the subject of this is the "Birth of Venus;" and lastly (1538) a grand cistern with "The Triumph of Galatea," who has paddles like a steamer to her marine car. This brings us to one of the chief gems of the collection, a most magnificent Limoges enamel dish of extraordinary size, painted inside and out in the most lustrous translucent colours upon black. The subject is "Apollo and the Muses." On the back is a beautiful arabesque design. The spectator may see near the centre the initials of the artist, "M. C." (Martial Courtois). Those who wish to judge of the excellence of the workmanship may well compare the large pieces by Bone on the ground floor, which are so cockled as almost to spoil the drawing. No. 1475 is a sixteenth century enamel, not fifteenth, as it is described. There are several excellent works of Bernard Palissy; the best is No. 1474. No. 1472 is also very good. We must not omit to notice two excellent Early Docchia figures with a pure white glaze, Nos. 1527 and 1529. The glaze and modelling are of the greatest merit.

Who can adequately describe the Sevrès china? It is scarcely possible that such a collection can ever be made again. Certainly, nothing like it has ever been exhibited. One of the most interesting points connected with it is that we have whole and perfect suites of vases, by which we are able to see that many shapes which, by themselves, appear clumsy or uncouth, when seen with the others that originally formed the set are really clever, if not according to the more correct taste of the present day. Many of the shapes, no doubt, are fanciful and unsatisfactory, but they were, at any rate, the result of much study and ingenuity. We wish that the Marquis had taken a fancy for the finest English china, that we might have had the opportunity of comparing the best of the Chelsea, Worcester, and Derby, with this very choicest of the French. If there is one point which strikes one more than another in considering this subject, it is the extraordinary variety and exquisite quality of the colours produced at the Sevrès manufactory. The lovely blue and white, and Rose du Barry and white, without any other enhancement than the precious, delicate gilding in which these artists so excelled, are quite as delightful as the most elaborate figure subjects. What can excel the delicious blue and white vases (817, &c.), with aquatic ornaments, the masses of gilding representing falling water? In their way, these are matchless, but there are several in the collection of similar beauty and value—for example, No. 931 is quite as fine as it is possible to produce; and as specimens of pure colour, only relieved by gold, we have certainly never seen anything to surpass Nos. 875 and 876—subjects with monkeys in gold upon the richest *gros bleu.* The mounts are also capital, in perfect harmony with the motive of the jars. The catalogue would be more complete if the dates of the pieces had been added. No. 773, flower vase, "Jardinière," the date of which is given 1757, depends almost entirely upon its colour and the exquisite taste with which the gilding is applied, for its charm. We have never seen so fine a specimen of Rose du Barry. It fully justifies the very high estimation in which this delightful colour has ever been held by connoisseurs, and the prodigious prices that genuine pieces of it fetch. The colour is said to have been the result of an accident. There are several other fine jars and smaller pieces of this colour, mostly in conjunction with green, but it is more beautiful when only ornamented with gold. No. 802 is interesting historically, having been presented by Louis XV. to Marie Antoinette when Dauphiness, whose monogram is inscribed on the sides. One of the rarest as well as the most magnificent suites is the splendid green "Nef de Vaisseau" vase and its row of companions with elephant-trunk handles. The flowers in the lid of the centre piece are exquisite. Another example of this curious shape is No. 808, a matchless specimen of *gros bleu* and green, with birds in the compartments, the perforated cover being surmounted by a flag. The mounting of this piece should also be noticed, showing the finest taste of the period. In workmanship and finish it could hardly be exceeded. For the bright green colour nothing is better than No. 848, vase and cover, painted with birds on white. We may mention the fine set Nos. 845, 846, and 847, as specimens of the purest turquoise. Nos. 792, 794, and 796, should also be noticed, both for shape and colour. There is a peculiarity about the set Nos. 751, 753, and 755, in which we have the *gros bleu* colour as perfect as possible—viz., some very choice festoons of gilt flowers by Le Guay; this feature is of the highest rarity. There are many other splendid sets, especially of the dark blue, which cannot fail to attract the notice of any who care for this description of art, as Nos. 947 to 949, and 931, &c. We will only notice further the excellent specimens of jewelling, one of the finest being a basin and ewer on turquoise ground, without a number, in the north gallery. Next to that comes a pink teapot covered with imitation jewels, and last not least Nos. 861, 866, and 868. The top of the principal jar is very fine. There are also two biscuit statuettes, Cupid and Psyche, upon stands of *gros bleu,* which show how skilfully and tastefully the artists of Sevrès could model the human figure. There are only two pieces of Dresden china (Nos. 911 and 912)—two vases, mounted in France as ewers, and so good examples of the porcelain and mounting of late Louis XIV.'s time. They are interesting as early examples of the mayflower, which was afterwards so fashionable in England.

We cannot close this notice of the pottery and porcelain without drawing the attention of our readers to a pair of matchless bowls of Oriental enamelled china (Nos. 1104 and 1104A), the ruby colour of which is of extraordinary excellence. There is not much oriental work of any kind, but what there is is carefully selected, exhibiting a perfect history of their mode of enamelling upon metal. Of the genuine *cloisonnee* there are two magnificent specimens from the Summer Palace, standing on the ground floor to the left as you enter the building. The rest will be found in the gallery close to the two bowls just mentioned. No. 1103 is one of the most curious, the process being rare. It is described in the catalogue as *cloisonnee*, but it is not truly so; the enclosures are not soldered on, but hammered and chiselled out, the interstices being filled in with enamel, run in, but not polished off, so giving the effect of tallow-faced cutting of precious stones, as if the colours had been dropped in when liquid, like frozen drops of coloured dew. We have seen a few specimens before in dagger handles and such things, but it is a mode of enamelling of which few important specimens have come to this country.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT SOUTHAMPTON.

(*From our own Reporter.*)

"UNTO Southampton do we shift our scene" seems to have been this year's motto of the Council of the Royal Archæological Institute of Great Britain and Ireland, and they could hardly have chosen a better one, for Southampton, rich in historical associations and archæological relics, offers more than usual scope for investigation and discussion by the archæologist. The town has rapidly increased in size and population during the past forty years, and the architect and the archæologist have much to be thankful for in the fact that while steam has made the town the prosperous place it now is, the inhabitants have not been altogether oblivious of the value of the many old structural remains of Mediæval times which give to their exceedingly clean and well built town the great charm of picturesqueness. To steam as utilised for purposes of locomotion, and to natural advantages of situation as one of our southern outports to France and the Mediterranean and a great *point de depart* to the East, Southampton owes its present commercial importance, making due allowance for the industry and the energy of its citizens. By the railway the *voyageur* from London to India and China is brought alongside the docks, and in the docks are always berthed one or more of the magnificent vessels constituting the fleet of the great Peninsular and Oriental Steam Navigation Company. Not only Southampton itself, but its neighbourhood, is rich in Roman and Mediæval remains and historical associations, and these, combined with great natural beauties, render the locality an extremely interesting one. The head-quarters of the Institute in Southampton were at the Hartley Institution. Here the sectional meetings were held, and a temporary museum fitted up.

FIRST DAY.—THURSDAY, AUGUST 1.

THE INAUGURAL MEETING.

The inaugural meeting was held at noon yesterday (Thursday) week at the Hartley Institution, Lord Talbot de Malahide, Permanent President, in the chair. The Mayor having spoken a few words of welcome to the members of the Institute,

Lord **TALBOT DE MALAHIDE** expressed his pleasure that in spite of modern improvements—which very often "improved" away altogether anything that was interesting or beautiful—there still existed some very interesting remains, notably the ancient gateway or "Bar," and portions of the old walls of the town. Having announced that the Bishop of Winchester (though then unavoidably absent) would be the President of the Congress then commencing, the chairman said that whether they looked back to Roman times, or to Saxon times, when Winchester was the capital of Wessex, or to Norman times—when the Norman Cathedral at Winchester was reared, when so many princely bishops did so much to cultivate and improve a love of Mediæval architecture, and when William of Wykeham and many others entered with equal zeal into the good work—it would be seen that the whole of England owed a debt to the district. It had given a great and powerful example in the maintenance, improvement, and perfecting of a noble style of architecture, showing a genius in the work which was almost equal to that which characterised the ancients.

The Venerable **ARCHDEACON JACOB**, in remarking upon the distinction between true and false archæology, stated that about fifty years ago the western end of Winchester Cathedral having been filled up with what was considered to be a good thing then, Roman cement, which, it was thought, would better preserve the stones, the Chapter determined to remove this, and, without removing any old stones, put new stones. Now if, on their visit to the cathedral, they stopped at the western door, they would, on the right, see a new stone of a yellow colour. They would ask, perhaps, "Why is it of a different colour to the stones around?" Well, there was once a niche there, in which was a figure of the Virgin. The question was deliberated whether they should restore the niche. Had it been a niche which was coeval with the building their love of archæology would have said, "Restore the niche," but when they came to touch this niche they found that it was not coeval with the original building, and it was decided to exercise their archæological tastes, and to take the really ancient, when it was no niche, in preference to the more modern, when the figure of the Virgin was introduced. This was the true function of archæology—to search into everything, and in continuing ancient examples to take the more ancient in preference to the more modern. The ven. archdeacon, having briefly detailed the reasons which had induced him to remove the tomb of William Rufus at Winchester from its original site to a more convenient spot within the cathedral,

Sir **EDWARD SMIRKE**, on the part of the Institute, thanked Archdeacon Jacob for the information he had so amply given; and Lord Henry Scott, M.P., on behalf of the landed gentry of Hampshire, addressed a few words of welcome to the members of the Institute.

Dr. **BOND**, of the Hartley Institution, in the name of the kindred societies of the county, also bade the Institute welcome, remarking that he regretted to state the kindred societies in that part were not in a very flourishing state; in fact, they were almost dying out, and he looked upon the Institute as missionaries who had come to revive them. Indeed, they would have been quite dead already had it not been for one or two local gentlemen, amongst them the Rev. E. Kell and Mr. Greenfield, and he trusted the visit of the Institute would result in the establishment of a flourishing archæological society in the town.

The **MARQUIS of BRISTOL**, on behalf of the Institute, thanked the landed gentry and the kindred societies for their cordial welcome, adding that he had had the pleasure of seeing the draft of a bill by Sir John Lubbock which, he believed, would set people thinking, and that before long legislation would be taking place tending to the preservation of the monuments of antiquity of which they ought to be so justly proud.

PERAMBULATION OF THE TOWN.

At 3 o'clock the members of the society and their friends perambulated the town, Mr. J. H. Parker, C.B., undertaking to describe most of its ancient features. Commencing with the Bargate, north front, with flanking towers on each side containing staircases, Mr. Parker said it was of two periods—Henry III. and Edward III.—and its machicolations of the fourteenth century were remarkably perfect. Proceeding to the Guildhall, he said they were in the original gatehouse of King John or Henry III., at which period the town walls were built. The greater part of the work, however, was altered in the time of Edward III. In the yard of Dr. Maule, attention was directed to one of the bastions of the old city wall, of thirteenth century work. Such bastions were, doubtless, continued at intervals all down the eastern side of the town. Proceeding on to the western shore by way of Orchard-street, Mr. Parker pointed out that the wall was not entirely Norman work, but that it was built against Norman work, and the parapet wall was of a later period—the thirteenth or fourteenth century, he thought. By the round tower, one of the fortresses at the north-west corner of the town, a considerable part of the wall was built against a cliff, and very likely the stone came from Quarr, in the Isle of Wight. There was documentary evidence to show that the river washed the foot of the wall. The wall in Castle-square appeared to have belonged to the castle said to have been built on an artificial mound, but as far as he could judge, by the nature of the ground, this was not probable, although it was possible that here, as elsewhere, the Saxons threw up a mound in the eighth century, and that upon it the Normans built their keep. The castle appeared to have been of the Edwardian period, but as the walls had been stripped of ashlar he could not say to what period they belonged. A bonded vault in Simnel-street was next visited. This was reputed to be the crypt of an old monastery supposed to have existed there, but Mr. Parker said that it contained a fireplace of fourteenth century work, and it appeared to him that the same mistake had been made here as in other places, by people thinking that Gothic work must necessarily be ecclesiastical, whereas he had no doubt that the place was a very fine merchants' vault of the time of Edward III. That part of the west wall of the town opposite the Long Rooms was pointed out as very curious. The wall requiring to be more strongly fortified as the modes of attack improved, this Edwardian work was built against the Norman work, and presented some interesting and peculiar features of the two periods. He knew no other wall like it, for instead of the ordinary machicolations, they were here made sufficiently long for a beam of wood to be slid up and down to resist the battering ram, and the alure or inner parapet of the wall was in some places very perfect. In Blue Anchor-lane are a perfect chimney, two-light window, and doorway of a Norman house of the time of Henry II.; in the interior of this house (now a slaughter-house), the shafts and capitals of the fireplace were seen to be very perfect. At the West Gate the double portcullis was pointed out; it had been a gatehouse and not merely a gateway, the protruding corbels near the roof being part of early work for bearing a wooden balcony for defensive purposes. In Mr. Marett's garden another place for letting a beam down, instead of an aperture for throwing down paving-stones upon an attacking enemy, was shown; and reaching the Spanish prison, now an icehouse near the Pier Hotel, Mr. Parker said he thought it was probably a building of the thirteenth century within the walls, there being, apparently, fourteenth century buttresses against a thirteenth century wall. At Porter's-lane, the remains of what Mr. Parker said a hundred years ago was a very fine building, known as Canute's Palace, were pointed out. It was of the time of Henry II., and very fine it had been, but the inhabitants of Southampton, having become rich within the past century, had destroyed many of the antiquities of the place in the rage for "restoration," as it was called, forgetting that these examples of domestic architecture had an interest of their own. At God's House, in French-street, was presented, until within the past few years, a most remarkable example of a merchant's house of the thirteenth century, but it had now been ruthlessly destroyed under the guise of "restoration," which was really devil's work to antiquarians. In justice to the modern architect, Mr. Parker said the interior of the church was much better than the exterior, for the walls, for the most part, were the original walls of the middle of the twelfth century. The exterior had been cased entirely. The roof was necessarily modern and unpretending, and the central arch of Transitional work was preserved. In the east end was a piscina of the thirteenth century—an insertion of later date than the chapel, and there was also a curious brass. Mr. Parker said that the thing he most regretted when viewing this group of buildings was the entire loss of the domestic buildings, which were perfect thirty years ago—a very rare instance of a Norman house remaining perfect, and which, he must say, had been wantonly destroyed. The neighbouring Gate he described as of Henry III.'s time, the larger outwork at the corner being a hornwork for its protection and the end of the eastern ditch, whilst the wall between was of two periods—Edward III. and Henry VII. Passing along Upper Canal-walk towards Bridge-street, Mr. Parker pointed out several portions of the wall, and remarked of one of the earliest of the round towers of Henry III.'s time that it was an unusually perfect specimen. S. Michael's Church was next visited. Externally, as Mr. Parker remarked, there was none of the old work to be seen, but the interior showed that the church was originally a very small Early Norman cruciform church, apparently without aisles, but with a central tower, to which various additions had been made in the form of chantry chapels at different periods, as was to be seen by the windows. It seemed likely that it had a flat roof, and that the three doorways or windows in the tower arch opened out upon it. The Norman work extended even to the end of the nave, on the walls both inside and outside, but the east end had been modernised, and all the walls had been refaced and made uniform late in the fifteenth century and in more modern times. It was not the intention of the old church builders that their churches should not be plastered and painted, for both these requirements were as much a part of the design as the doorways and windows, but when once the plaster had been stripped off it was a question whether it might not with advantage to archæology be left off, for, as in the present church, it could at once be seen, by the straight joints, exactly where the additions were made. The font was very remarkable, with its square top and detached Late Norman shafts. It was made of very hard stone, not improbably brought from Normandy, and was one of but three of its kind, he believed, to be found in this country. Its sculptures were of the middle of the twelfth century in date. The lectern was a good specimen of fifteenth century work. Mr. Parker directed attention to an aumbry and piscina of the thirteenth century in the east end, with two side arches of the fourteenth century leading to chapels added at the time. The perambulation of the town was terminated by the inspection of an apartment on the western shore, approached through a window in the wall, the corbels left in which were Norman, and Mr. Parker thought it might have been a wine store, but the workmen there said there were traces of colouring upon the walls.

In the afternoon a visit was paid to Bitterne, the ancient

CLAUSENTUM.

The site of this Roman station is situate about a mile from Southampton, on a small peninsula formed by the winding of the Itchen. Fosses being cut through the peninsula, two islands were formed, the inner one being surrounded by a wall and circular towers, the outer one guarded by a rampart. It was much occupied by Tetricus, two of whose votive columns are there, and piers were discovered for the anchorage of Roman vessels. An altar to the goddess Ancasta, and abundance of coins, Samian ware, &c., have been found here. The site is now occupied as a residence by Mr. Stuart Macnaughten.

In the evening the Mayor and Mayoress gave a *soirée* at the Hartley Institution. Over 800 invitations were issued, and a large number of these were accepted.

SECOND DAY.—FRIDAY, AUGUST 2.

The members of the Institute held a meeting for business purposes in the reading-room of the Hartley Institution at 9 o'clock, when the annual report was read, and Exeter was chosen as the place of next year's meeting. The section devoted to History met afterwards, when Lord **HENRY SCOTT**, M.P., gave an address on

THE HISTORY OF HAMPSHIRE.

In the course of his remarks, the speaker said that it was to be regretted that one of the most interesting, historically, of all the counties, and which possessed such a capital as Winchester, possessed neither a good historian nor a county archæological society. Looking at any map on which the Roman roads of Britain were delineated, it would be seen what an important position Winchester must have held as a centre in Roman times, for a network of Roman roads, one leading northwards to the city of Silchester, whence London could be reached in one direction and Cirencester on the other; one leading south (whence came all the traffic from Gaul) to Clausentum (now called Bitterne), the ancient Southampton; one leading westward to Salisbury and Bath; one leading south-east in communication with Porchester and Chichester; while lesser lines led to Tatchbury and Ringwood and the east. Having alluded to many historical events connected with the city and its cathedral, his lordship referred to the Castle and Hall, and the palace of King Charles. He observed that it was satisfactory to know that the hall, where the assize courts had hitherto been held, was being restored to its ancient beauty, and would form part of the new buildings. Following the Itchen, past S. Cross, Southampton was reached. Although the present Southampton could not boast the antiquity of Winchester, its interest was very considerable. An ancient British town named Anton, or Hantone, probably situated a little higher up the river than Bitterne, gave its name to the present town and county. South Hampton was supposed by some to have been so called to distinguish it from Northam, when the Saxons abandoning Clausentum moved further south to the point of land upon which the town now stands. Leland gave a good description of Southampton, "with its eight bar gates, its great double dyke full of water, and the four towers on its walls. The east gate is strong, but nothing so large as the Bargate, and S. Mary's Church of New Hampton standing without the gate." He speaks of the glory of the castle, it having a donjon or dungeon, which was very large, fair, and very strong, and said there were three principal streets, whereof "that which goeth from the Bargate to the water-gate [High-street] is one of the fairest that is in any town in all England. It is well builded for timber building. There be many fair merchants' houses in Hampton. There cometh fresh water into Hampton by a conduit of lead, and there be certain coslelets into the conduit within the town." Having referred to the Norman domination and the history of the New Forest, the lecturer said that among the relics left by the Normans of their great spirit of piety and power were the Abbey of Beaulieu, the Priories of Titchfield and Christchurch, the preceptories of the Templars of South Baddesley, Godsfield, and Selbourne, the Castle of Merdon, and Carisbrooke Castle. In conclusion, he said that while deploring the ruin which had befallen these foundations, it was cheering to know that the love of preservation of what was old was at work to keep intact as much of these beautiful monuments as remained to us, those who now possessed the land which the monks held evincing no want of pious care for their preservation.

Lord **TALBOT DE MALAHIDE**, in proposing a vote of thanks to Lord Henry Scott for his paper, strongly supported its suggestions as to the compilation by competent men of a good county history and the establishment of a good county archæological society. There was hardly a county in the South or West of England in which there was not a flourishing association of that kind, and it would be gratifying if the Institute's visit should prove in any way instrumental in giving an impetus to the formation of such a society.

The Rev. F. W. **BAKER** then read a paper on the history of

BEAULIEU ABBEY.

Mr. **BAKER** said that before commencing his remarks on the history of this humble Cistercian monastery, he wished to say that the Duke of Buccleuch had supplied the means and given him permission to dig wherever he thought it was necessary. According to a Cottonian MS. now in the British Museum, King John, in the sixth year of his reign (1204), commenced the Abbey of Beaulieu, to appease the clergy, whose displeasure he had incurred. The church appeared to have been completed in 1227. The magnificent scale on which the royal Abbey of Beaulieu was erected was such as to leave a debt of four thousand marks upon the completion of the work. The Abbey was consecrated in 1244, Matthew Paris giving a very quaint account of the dedication. Wall-painting seemed to have been extensively carried on, almost every stone which had been found bearing marks of colour. A few special privileges, such as that of sanctuary, pertained to the place. In 1539 the monastery was surrendered to Henry VIII. [Further particulars of these buildings are given in our account of the visit paid to them on Saturday last.]

LORD HENRY SCOTT, in proposing a vote of thanks to the reader of the paper, said that Mr. Baker had lived for twenty years at Beaulieu, and had made the Abbey an especial study. As to the gatehouse, which was at present known as "the Palace," and was used as his (the speaker's) residence, those who visited it on the morrow would find it in an extremely favourable condition for examination, for the two modern wings had been pulled down, in order to make way for more commodious residential buildings. These two wings were built at the back of the house in the seventeenth century, small angle turrets were added to the gatehouse, and a moat was dug round it at the parts which were not already surrounded by water, so as to make the place present the appearance of a French chateau. Mr. Blomfield was at present restoring the gatehouse, and additions would be made at the back from his designs, so as to give due prominence to the features of the old work.

The meeting having been brought to a close, a special train left Southampton at half-past 12 o'clock for Romsey, where, in the Town Hall, the vicar, the Rev. E L. Berthon, read a paper on

ROMSLY ABBEY.

Mr. **BERTHON** said that the records of the Abbey were few and fragmentary, but since the churchyard had been closed against burials he had been able to make explorations beneath the surface, from which it was easy to arrive at a very correct idea of the various and successive surroundings of the church, and of the changes that had been made in the structure. Inasmuch as the bulk of the buildings were towards the south, it was probably founded by the Cistercian order of Benedictine nuns. Very little, however, could be gathered respecting the founders of the Abbey, and still less of the builders of the present church and that which preceded it. What little was known was, however, very well put together in a paper read in 1862 by the Rev. Mackenzie Walcott. Notices of a monastery at Romsey before the Conquest were very meagre. About two miles from Romsey was a very ancient house called "Stambridge," formerly a country residence of our Saxon kings, and here Ethelwolf with his four sons had lived, and there was direct testimony that the convent was first founded by Edward the Elder (904-924). The most probable date of the foundation was 916. Underlying the present edifice Mr. Berthon said that there was a good deal of work which he could not but associate with the Saxon building. It would appear that the conventual buildings and church of Edward the Elder were not considerable in extent. The first abbess of which there was any record was Merwenna, who was appointed by Edgar in 967. That was known to be *the* epoch for the revival of monastic establishments. In 992 the Danes, headed by Sweyn, invaded and plundered the Abbey. About that time a very holy woman named Ethelfleda was professed here, and became abbess until her death, after which she was canonised, and the present church was dedicated to her and to the Virgin Mary. Romsey Abbey church was thus unique in having a double dedication. There was a remarkable effigy of Ethelfleda in Purbeck marble in the south transept, dating from the end of the twelfth or the beginning of the thirteenth century. As to the question "Who built the present church?" it was strange that one of the finest Romanesque churches, not only in England, but in Europe, should retain no record of its builder. In the south choir aisle there were crowned figures which he thought represented Edward the Elder and Edgar. The general arrangement of the church and many of the details were identical with those of the great church which was built by Henry I. at his magnificent residence at Reading. A mason's square had been found inscribed *Robertus me fecit.* Robert was not a Saxon, but a Norman name, and Robert was a natural son of Henry I. He (Mr. Berthon) thought that the church had been begun by Henry I., but that the work had stood still during Stephen's reign, and was not finished until the time of Henry II. It was said that Henry de Blois, Bishop of Winchester, built the Abbey, but of this there was no satisfactory evidence, although we knew that he built S. Cross, and that while his niece Mary, the only surviving daughter of King Stephen, was Abbess of Romsey. There was a certain general agreement between the buildings at Romsey and S. Cross, but the whole feeling of the ornamentation and detail was entirely different. It was far more probable that the Abbess referred to, while her uncle was busy with the building of S. Cross, built the grand Abbey church at Romsey, and if that supposition were correct, the suppression of the name of the builder was easily to be accounted for by the fact that she had grievously sinned against the Church. The present parapets to the roofs he had lately proved to be without exception of modern date. The roofs had been recently restored under the direction of Mr. Butterfield. The Norman nave consisted of five bays. The tower roof must have been originally, in the opinion of Mr. Berthon, of considerable pitch, because lead flats had not been introduced at that date. Most probably the roof was pyramidal in form, like those of several of the older Continental churches. From careful investigation, it would seem that the only lead used for the roofs was that for the flashings, and in restoring the roof on the south side portions of the flashings were discovered let into the wall. These were not removed, but the new lead was fused and joined on to the old flashings, thus uniting in one unbroken surface the leadwork of 1150 and 1866. The chancel was not apsidal, but rectangular, but nothing was really known about it until about six years ago. The Lady chapel had two altars, one dedicated to S. Ethelfleda and the other to S. Mary the Virgin. The Lady chapel was two steps lower down than the rest of the building. The only windows on the north were two clerestory windows above the triforium arches. Beneath the floor of the Lady chapel, which was exactly level with the floor of the retro-choir, Mr. Berthon had found a mason's punch. The whole conception of the building was that of a master mind. No measurements were taken, and no elaborate architects' drawings were prepared. Nothing was exactly straight, and no angle, except by accident, was a right angle. Nor was there any part of the building which was exactly symmetrical. Truly, there were *Free*masons in those days. (Laughter.) But did we not unconsciously delight in such regular irregularity, which gave us a touch of nature and showed man's handiwork, but not the work of a machine? Such was the church of the twelfth century. The church was built in a transitional period. With the introduction of the pointed arch in what was called Early English arose a style of architecture entirely different from the Romanesque. In the thirteenth century the nave, which originally consisted of five bays, was lengthened to seven bays. The old parish church of S. Lawrence was not, as most people believed, attached to the belfry of that name, of which the site was still in the possession of the parish, about eighty yards north of the chancel, but was actually a part of the minster itself, and consisted until 1372 only of the north aisle of the nave, in which year an outer aisle was added to it by colonnading the north wall by license of William of Wykeham. As before stated the church had not an apsidal termination to its choir, which appeared to have been a modification of the basilica type. As in other early churches, its altars were very slightly raised, and were placed at some distance from the east wall, thus allowing the priest to go behind the altar and consecrate the elements with his face to the people. Attention was called by Mr. Berthon to certain piscinæ in one of the chantries—one evidently of Norman date, quite low down, and another 18in. higher, of Early English date. The former was used when the altar was on the ground, the latter when it was subsequently raised on an elevated mound of concrete. In conclusion, the vicar adverted to the recent gift of £1,000 towards restoring this beautiful Abbey, removing the unsightly galleries and pews, &c.

A vote of thanks to Mr. Berthon, proposed by the Bishop of Winchester, having been carried by acclamation, the archæologists went over the Abbey, when the most interesting features having been pointed out and explained by Mr. Berthon, the train was taken to Porchester Station, whence the party proceeded to

PORCHESTER CASTLE.

Porchester, the Portus Magnus of the Romans, is said to have been the landing place of Vespasian. Since then the sea has much receded from it. The present quadrangular fortress is Norman, partly erected on the old Roman works, and exhibits in a portion of its walls excellent specimens of Roman material applied in later construction. The keep has two massive Norman towers. The parish church of S. Mary is situated within the outer part of the castle area. It was originally a cruciform structure, founded for the Augustinian monks by Henry I. The west front contains a Norman window and a highly enriched doorway. The font is also deserving of attention.

Mr. J. H. Parker said that the gatehouse was fourteenth century in date. The west front of the church was a remarkably beautiful example of a front of a small Norman church. He had it engraved twenty-five years ago, and he did not know of a better example anywhere. The date was about the middle of the twelfth century. It was built of Caen stone, as was also the keep, and was an exceeding good piece of construction. The sculpture was extremely good and very delicate in execution. The most perfect parts of the church were the west front and the north transept. The south transept was gone, and the chancel was very much mutilated. The arcade in the north transept gave a fair idea of what the church was. The ornament was all Late Norman, *temp.* Henry II. The traces of a lepers' window at the east end of the north aisle were pointed out. The original roof of the nave must have been flat, and covered with lead. Adel Church, in Yorkshire, had enormously thick wood beams in its roof, almost touching one another, and it seemed to Mr. Parker that those beams were originally covered with a lead flat. The interior was at present remarkably plain. There were no remains of painting, and the construction was so good and the ashlaring so excellent as to imply that the walls were always meant to be seen. As to plastering the walls of churches, Mr. Parker remarked that that was invariably the practice, as many kinds of stone used by the Mediæval builders would not stand the weather. This plastering was carried out both externally and internally, and generally the interior was painted and repainted every century or so, according to the fashion of the time, specimens of fifteenth century painting being frequently found over thirteenth century work. At the west-end of the nave at Porchester, besides the western door, there were doors opposite to each other, and opening north and south, in order to allow of the west door being shut in severe weather, and to enable coffins to be brought into and taken out of the church without turning. In many churches there was a lychgate at the entrance for placing the coffin under before it was carried into the church.—It was pointed out by Mr. Kell that there was an exceedingly curious arcade in the old Roman wall due south of the church, and he could not but think that it marked the spot where the chapter-house stood.

The old Roman water-gate of the Castle was pointed out by Mr. G. T. Clark. The arch of this gate, he said, was distinctively Roman, and had been very slightly if at all altered since it was left by the Romans. It was built of a very fine white limestone and a very durable iron-red sandstone. Another Roman arch in the interior, less perfect, was also pointed out. The gateway was built upon a Norman foundation, and in many respects resembled Norman work. All the walls of the *enceinte* were Roman, although they had been cut about and increased in height by the Normans. Great pains were taken in this as in other Norman keeps to prevent the inner works from being attacked from the outer gateway, in case that gateway should be captured by the besiegers. The sites of the inner and outer baileys and of the drawbridge and moat were next pointed out by Mr. Clark, and the keep was then visited. This keep was divided into two equal parts, as at Rochester, and the party wall bore traces of having been pierced by some very handsome archways. The basement was not originally vaulted; indeed, in all Norman castles it was very rare to find a vaulted basement, and when such vaulting had been found, as at Richmond, it had generally been added. At Porchester there was vaulting at a later period, and the springers of the ribs were pointed out, but this vaulting had been added in the Perpendicular period. In one corner of the keep Mr. Clark pointed out the pipe of the well. The keep had not originally so many floors as at present, the existing floors having been put in in order to economise space for the confinement of the French prisoners. There was no evidence of anything earlier than the time of the Romans, except the earthworks, which were undoubtedly Saxon, and very remarkable and curious. The remains of the banqueting hall and chapel having been pointed out and remarked upon by Mr. Clark, that gentleman concluded by pointing out that Porchester was a very important station of the Romans, inasmuch as it had roads running to Winchester and Clausentum.

The excursionists then returned by rail to Southampton, a *conversazione* being held at the Ordnance Survey Office later in the evening.

THIRD DAY.—SATURDAY.—AUGUST 3.

On Saturday morning a special train left Southampton (West) Station at 9 a.m. At 10 the train arrived at

CHRISTCHURCH.

Here the visitors first made for the Priory Church, said to be founded on the site of a Roman temple. In 1150 it was converted into a priory of Augustinian monks. The church has a nave and choir, with aisles; a transept, with two eastern chapels, a Lady chapel, and western tower. The church, generally speaking, is of the Norman and Perpendicular styles. The nave is 118ft. long, 58ft. broad; the choir, 70ft. long, 21ft. broad; transept, 100ft. long, 24ft. broad. A beautiful rood screen divides the nave from the old choir. There is a monument to the poet Shelley in the tower, by Weeks, and one to Viscountess Harris, by Flaxman. The company having assembled in the choir,

Mr. Burtt read a paper prepared by Mr. B. Ferrey, F.S.A. Mr. Ferrey stated that the earliest church and monastery here had been attributed to King Athelstan, but of that early structure no trace remained. In the time of the Confessor there were a dean and college of secular canons here, with a church dedicated to the Holy Trinity. Flambard, the architect of Durham Cathedral and of Norham Castle, rebuilt the church, or a great part of it. It was said that he destroyed the ancient minster and nine smaller chapels, and that the new buildings were carried on by Dean Ralph until 1195. Whatever Flambard's intentions were, the duration of his connection with the priory was not long enough for him to have built the entire church, as he was promoted to the see of Durham in 1099. The subsequent benefactors to the church were the De Radvers, earls of Devon, and their descendants, Isabella Countess of Albemarle, and Hugh Courtenay, Earl of Devon, the Montacutes and Monthermers. There was, however, no historical evidence to show by whom the successive portions of the church were built after Flambard's promotion. The only indications of the architectural history of the church were derived from the dedications of altars—those of S. Saviour (the high altar or canons') and S. Stephen in 1199; Holy Trinity (the parochial or vicarage high altar in the nave), S. Peter and S. Paul, S. Augustine, S. John the Baptist, and S. Edward in

1214; and of S. Michael and S. Martin in 1221. An altar of S. Nicholas is mentioned in the fourteenth year of Edward III. Sir Thomas West, who was interred in the Lady Chapel, in his will dated 1405 devised that his body should be buried in the new building, and bequeathed £100 towards the works in the church, probably those in progress in the choir. The great interest belonging to the building was concentrated in its architectural features, and they were of no common order, there being specimens of every style of English architecture, from the earliest form of Norman down to the decadence of the Perpendicular period, even to the introduction of *Cinque-cento* ornamentation. The plan of the church spoke for itself, but no traces could be found showing the original form and dimensions of the Norman eastern arm of the cross as designed by Flambard, nor of the western extremity of the nave. It could scarcely be doubted that the foundations for the new structure which he intended were completed in their entirety before his promotion to Durham, but the superstructure, as erected by his successors in the deanery, had concealed all signs of Norman work eastward of the transept. It was probable, however, that the eastern end of the chancel would have terminated in an apse. The east apsidal chapels to the transept were in accordance with the usual plan of Norman Abbey churches. The author then touched on the peculiarities of Flambard's work at Christchurch, and compared it with his greater work at Durham, remarking that the conception of the plan of the nave of the Cathedral was most imposing, and that whatever might be the dignity of the well-known Norman naves at Romsey Abbey and Norwich and Gloucester Cathedrals, or those of the Abbaye aux Hommes and Abbaye aux Dames, at Caen, and Bayeux and elsewhere, there is not the solemn grandeur which is so remarkable at Durham. The nave of the church consists of seven bays. Every bay is divided by a clustered group of semicircular shafts connected by square piers, each shaft having a capital ornamented with the peculiar foliage resembling the Grecian honeysuckle, these again carrying semicircular arches slightly stilted, with square and semi-round members corresponding to the shafts below. Two of the shafts facing the nave and dividing the bays run through the triforium and terminate a little short of the floor of the wall passage, where some Transitional corbels of peculiar form, grafted upon the Norman shafts, form the springing line of the Early English vaulting, of which the springers and the wall-ribs remain, and to which the modern plaster ceiling conforms. The spandrel walls of the lower arcade are ornamented with hatchwork and fish scales; a stringcourse of chevron ornament finishes the arcade, whence springs the triforium, each bay containing double engaged circular columns, carrying a bold semicircular arch enclosing couplet arches in a second order resting on a central column, and corresponding engaged shafts. The peculiarity in this design consists in the point at which the groining springs being some feet below the path of the clerestory or upper wall passage. As a general rule, groining springs on a level with the clerestory, whereas both here and at Durham the vaulting commences from an unusually low position. It is somewhat remarkable that neither at this church nor at Durham did Flambard complete the clerestory or groining. The manner of Flambard is at once original and marked, and both here and at Durham he adopts the same peculiarities. Again, in comparing the aisles of the two churches, it will be seen that the wall spaces under the windows are ornamented with bold arcading, both within and without. Here the inner arcading, as seen in the south aisle, consists of semicircular arches ornamented with the billet moulding carried on detached shafts, and externally are discoverable (though covered by later work) the traces of bold intersecting arches and columns, such as may be found all round the north transept. At Durham by way of difference the reverse arrangement occurs; internally the wall surfaces under the aisle windows have an arcading of intersecting arches on single columns, while externally the lower part of the church is ornamented by a series of arches and pillars similar to those on the inner face of the south aisle. Nor do general resemblances end here, and in the mode of lighting the triforium we perceive the identical disposition of single light windows; and attached to the back of the greater piers there are well defined flat projections with corresponding projections against the outer walls, evidently built to receive semicircular arches, which, by their bulk of masonry, should act as counterforts to the thrust of vaulting, giving conclusive evidence that Flambard intended to groin the nave. So far, in many respects, the works of this great architect carry the impress of his manner, and in noticing the points of departure we observe that they are such as would follow in consequence of the increased scale of the Cathedral over the Priory church. The nave of Durham is one of the most grand and imposing designs in this country. The introduction of the massive cylindrical column alternately with the clustered piers is most happy in effect. Flambard did not live to carry out his full intention at Durham, either by groining nave or putting a flat ceiling, yet the preparations alluded to showed what he would have done. Prior Melsonby, notwithstanding the change of style which had taken place, was to be commended for his good taste in availing himself of the semicircular instead of Pointed vaulting, thus completing the work which Flambard had commenced in one homogeneous style. In the round turret of the north-east angle of the south transept the latticework ornamentation is most striking and effective, and is really like a net formed by large ropes girting the masonry and holding it together. Its application to a round structure on such a large scale is perfectly unique, and it is difficult to resist the supposition that some symbolism was intended by the composition. The spandrels of the intersecting wall arcade at the base of the transept are wrought with the fish scale and herring bone channelling, while the twisted columns, by their varied convolutions, seem to be borrowed from the forms of the shells abounding on the shores of the sea close by. The gable of the south transept of Durham Cathedral, as also the lower stage of the Galilee Chapel, are filled with similar bold network ornamentation. He was not aware that any other Norman building possessed that mode of decoration upon so large a scale. There was a little of the kind in the west front of Rochester Cathedral, but so diminutive in proportion that it merited little notice. In comparing the compartments of the naves of Christchurch and Durham Cathedral, the close resemblance between them would be seen. The other Norman portion of the church which possessed much interest was the apsidal chapel on the east side of the south transept, which till lately was completely separated from the transept by a close wall, and the opening out of this apse and the chamber over had developed much of the ancient form of the church. Next in interest to Flambard's work were the Early English portions of the east side of the north transept and the re-vestry on the south side of the south aisle of the chancel. There was much beauty in these portions, and they were all worthy of a careful examination, and the floor tiles of the re-vestry were also interesting. One of the most interesting discoveries had been made in the exterior of the south aisle of the nave, where, upon the removal of some rough stucco, the ancient prior's door next to the transept was brought to light, and was found to have the character of French work, and was evidently very Late Norman work. The modern plaster groining, which, however, was perfectly correct in form (the walls, ribs, and springers of the ancient work being used again), concealed a very handsome oak roof with cusped wind-braces and other ornamental features. This roof, which at its original height must have been very majestic, had, however, undergone many changes, and was reconstructed at some later time to a lower pitch. Much of the old painting on the timbers, however, still remained. It was probably put up originally in the time of Edward III., but whether the stone groining was ever completed must be matter of conjecture. The traditional account of the fall of the upper portion of the central lantern seemed very probable, as there are still indications of injury from some catastrophe visible to the south of the great arches of the lantern, and it might at the same time have destroyed a large portion of the nave vaulting. Before closing his notes of this church Mr. Ferrey said he must reiterate his opinion as to the undesirableness of removing the ancient rood screen, which marked the complete divisions of the church, and concealed some awkward structural arrangements. The disturbance of such an important feature of the building would utterly destroy the completeness of the plan of the church. He yielded to none in the wish to see the services of the Anglican Church carried out in their integrity, but he believed that in this instance it was very problematical whether the destruction of the screen would secure a better congregational service, while the mischief that would be done by the annihilation of the ancient plan would be simply irreparable.

The visitors then perambulated the church under the guidance of

Mr. J. H. Parker, who cordially concurred with what Mr. Ferrey had said in his paper on the subject of the screen, which ought on no account to be removed, as it was part and parcel of the original plan of the church. As to its alleged interference with the services of the Anglican Church, it appeared to him that it did just the contrary. It separated the choir (which was intended for the communion service) from the nave (which was intended for the Sunday congregational services). If the screen were removed neither of those parts of the building would be so convenient for their respective uses. At first sight the chancel appeared to be altogether of the Perpendicular period, *temp.* Henry VII., but it was not entirely so. The Mediæval builders were very economical, and in adding to or altering a building they used up as much of the old fabric as possible. The thick massive walls of the chancel were not built in the time of Henry VII., but were Norman. There was a series of rooms over the chancel, as was very commonly the case in Ireland. At Compton, near Guildford, there was a vaulted chancel with a chapel over it. The woodwork in the chancel of Christchurch was of the time of Henry VIII., and was very good of its kind. The misereres were particularly good. The chantry chapels were very beautiful. The rood screen was a very remarkable example—the finest, in fact, remaining in England, without any exception. It represented the Tree of Jesse, with the Nativity, the Adoration of the Magi, the Ascension, and other events in the life of Christ. Mr. Parker strongly deprecated any attempt at its restoration: it was far too valuable. (Hear, hear.) As it was it remained the work of the fifteenth century; restore it, and it obviously became nineteenth century work. The greatest mistake in the world was the mania for restoring everything. (Hear, hear.) The Lady Chapel was entirely an addition to the original building, but it was probable that there was originally Norman work on the site, as the walls were unusually thick at the lower part. Altogether the church was one of the most magnificent in the country, and dated from the earliest period. The Norman nave was exceedingly rich, and it was very unusual to have the surfaces of the spandrels of the nave arches decorated so richly. The nave was of Henry II.'s time—Early Norman of about the middle of the twelfth century; the tower arches, however, were of earlier date. The choir was no doubt built first, according to the usual custom, then the transept, then the central tower, and then the nave by degrees; or as was very often the practice, the western towers were built before the nave. Here the nave was a good deal later than the other work. Having examined a few of the external features of the church, the visitors proceeded to the ruins of

The Priory Castle, which are situated a little to the north of the Priory Church. The Castle has only two ruined walls of a small keep standing. The remains of a building with a small tower, supposed to have belonged to the Castle, and to have been the residence of the governor, exhibit fine specimens of twelfth century work. Mr. Parker here directed attention to a very remarkable Norman chimney, the best and one of the earliest examples of its kind extant. With reference to the existing bridge over the Avon, at this point, it was suggested that the piers were Norman, but Mr. Parker gave it as his opinion that they were Edwardian, and in this opinion he was said by one of the visitors to be confirmed by documentary evidence. The mill stream running parallel with the Avon and alongside the Castle was mentioned in Doomsday Book. Judging by comparison and history, Mr. Parker said that the keep was Norman, built upon a Saxon mound of earthwork. It was very commonly the practice of the Normans to build their strongholds upon such earthworks as they found. A great deal of the work that remained was very probably of the time of Henry II., and possibly the banqueting hall was earlier—*temp.* Henry I. M. de Caumont, the distinguished French architect and archæologist, had come over to England some years ago to study the castles built by the nobles who came over with the Conqueror, with the idea of endeavouring to find out, if possible, what was the structure of the buildings (if any) which preceded those castles, but he was unable to discover any work earlier than the eleventh century. The fact was that the Saxon fortifications consisted only of earthwork and wood: the wood had perished, but the earthworks remained. Indeed, the Saxon word for building was synonymous with our word *timbering*. The earliest stone keep was that built by Gundulph at Malling, in Kent. The keeps in this country of Henry II.'s time, and those of Normandy, were of the same general character. Those in this country were very numerous, being erected wherever possible in sight of each other, in order to keep the Saxons in subjection. As to the earthwork upon which the keep of the Priory Castle stood, Mr. Parker expressed the opinion that it was made in the eighth century.

The party then broke up for luncheon, and the visitors started at one o'clock from Christchurch

Station for Beaulieu-road, where carriages were in attendance to convey them to

BEAULIEU.

Here the company was received by Lord H. Scott, M.P., who occupies the old gatehouse of the abbey (known as "The Palace") as a residence. Beaulieu was an abbey founded by King John in 1209, and belonged to the Cistercian order. Near the centre of the hospitium was the access to the conventual buildings. In the cloister court is the lavatory, situated between the two refectories. Noticeable among the objects of interest still remaining are some relics of the sacristy and chapter-house. The passage and a portion of the monks' refectory still remain, and the ground plan of the ancient church is discernible by stones on the sites of the pillars. The church terminated in an apse. Beaulieu Abbey Church was probably the largest Cisterian church in the kingdom. The abbot's house was on the south-east of the chancel. The present parish church is the ancient refectory, containing a remarkable stone pulpit of beautiful design. Great variety of sculpture is seen in the intersections of the ribs of the roof, representing the Montagu and Buccleuch arms, the Beaulieu arms, &c. There are relics of the ancient kitchen between the two refectories, and the remains of the ancient wine-press still exist. Entering by the clock house, which, according to Mr. Parker, is of the Edwardian period, except the wings, which are of modern construction, the visitors proceeded to the old abbey gatehouse, now used as a residence. This gatehouse being now in course of restoration, and the modern wings having been pulled down in order to be rebuilt so as to enlarge the residence, the visitors had an exceptionally favourable opportunity of examining the old work.

Lord HENRY SCOTT, M.P., pointed out that the present porch was comparatively modern, and that traces were visible of a very large archway through which carriages entered the abbey precinct. The buttress to the left of the porch was engraved in Parker's "Glossary," and was known as the Beaulieu buttress. In the niche above the porch it was supposed that there was formerly a statue. Beneath the cornice was a row of what he believed to be Norman heads serving as corbels. If they were in their original positions it argued that the building must have been Norman in character originally, but there was nothing else either within or without the building to identify the building as Norman. The two gables above the cornice were entirely modern —probably of about the middle of the seventeenth century.

Mr. J. H. PARKER said the architectural history of the building was doubtful. There was a good deal of patchwork in it. The doorway was an Elizabethan addition. The buttress was of Edward I.'s time. The corbelled heads were not Norman, but of the time of Edward I. or Henry III.; that they were not Norman was evidenced by the costumes, the wimple being shown on one of the heads. He could only account for the heads being in their present position from there having been considerable alterations and additions made to the building in the time of Elizabeth or James I., when a great deal of old material was re-used.

Lord HENRY SCOTT said that the building had been restored partly from conjecture by Mr. Blomfield, and curiously enough a portion of one of the original windows since discovered corresponded almost exactly with the window as restored. Entering the gatehouse the original arch of the gateway was shown in its original perfection, and Lord Henry had had a portion of the present floor removed, showing the original floor at a depth of about 3ft. Mr. J. H. Parker said that internally the character of the work seemed more like that of Edward III.'s time than that of Edward I.'s, but in domestic work of what was for convenience designated the Edwardian period it was difficult to draw a line and say positively the work was of this or that reign. Having ascended to the room above, Lord Henry Scott said that before its restoration it presented an entirely modern appearance, the windows being fitted with sashes. In the course of the restoration a beautiful aumbry and piscina were discovered. Before the restoration nothing could be seen of the upper part of the chamber. The central pilaster of the arcade on one side of the room was not exactly as it was, because formerly both the arches of the arcade opened into the chamber at the back where there was a small aumbry. Mr. Parker observed that the front chamber was formerly in all probability a chapel over the gateway, with a priests' room behind. With regard to the restoration, it was very gratifying to see such careful and conscientious work. If all restoration was as conscientiously carried out as in the present instance, it would be more favourably regarded. Mr. Parker having directed attention to a remarkable square-headed Decorated window at one end of the chamber, the visitors proceeded to inspect the remains of

The Monastery and Abbey.—The Rev. F. W. Baker, who acted as *cicerone*, first of all pointed out the main drain of the monastery, which has lately been opened for a considerable length. It had been groined over in some parts, and covered with slabstones in other parts. Means had been provided for flushing it by means of water from one of the hill streams. Looking towards the refectory, now the parish church, attention was directed to the great buttress which entirely blocks up the central west window. The old porch of the abbey entrance into the cloister was pointed out, and to the left of it a square opening leading to cellarage. Lancet windows were continued down the whole depth of the wall, and constituted one side of the ambulatory. Above was the original triforium of the abbey. The hospitium, where strangers were lodged, was next inspected, and the party then entered the refectory, noticing as they went along the ancient iron work on the door, the lancet windows over the door, the corbels which formerly carried the cloister roof, and other interesting features. Inside the building, the Rev. F. W. Baker directed attention to its principal points of interest. Foremost amongst these was the beautiful old stone pulpit, where the Abbot's Bible Clerk used to read the Scriptures during dinner. Particular observation was directed to the curious and beautiful arcading enclosing the recess in the wall by which access was gained to the pulpit. The building illustrated very clearly two distinct periods of architecture. The upper parts were Late Decorated in character, but the lower parts were very much earlier. The present was not the original roof, though it contained some very interesting heraldic and other shields upon the bosses. The present floor is 3ft. above the level of the original floor. It was greatly to be regretted that the large buttress before referred to at present blocks up the central triplet. The refectory, it should be remarked, runs north and south, and not east and west. It was suggested by the Rev. E. Kell, of Southampton, that the arcaded passage by which the pulpit was approached was also used for singers to stand in and sing the grace, but Mr. J. H. Parker said that this sort of arcaded recess was by no means rare, but he knew of no evidence which would support Mr. Kell's suggestion. The lower part of the pulpit was rather earlier than the upper part. The building was commenced about 1204, and was finished about 1244. Having inspected the site of the abbey church, the positions of the piers of which were marked by flags, the visitors, after being entertained by Lord Henry Scott, took carriages and proceeded to

LYNDHURST,

a very picturesque and charming village, and known as the capital of the New Forest. Here the visitors inspected the modern church, built fourteen or fifteen years since, from the designs of Mr. William White, F.S.A., F.R.I.B.A. The carving and other details of the building were very greatly admired, Mr. J. H. Parker pronouncing the building to be a very good specimen of the Victorian style of architecture." The chief attraction in the church was the very beautiful fresco at the east end, by Mr. Leighton, R.A., representing the "Wise and Foolish Virgins." Several of the visitors expressed the wish that the frescoes at Westminster were as well preserved as this, but then the Lambeth potteries are not in the New Forest. Having visited the King's House, where the verderers of the forest hold their courts, and where the spur said to have been worn by William Rufus on the day of his death is exhibited, the visitors took the carriages again, and were driven to Lyndhurst-road Station, whence they returned by rail to Southampton.

[A report of the remainder of the proceedings will appear in our next.]

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THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT WOLVERHAMPTON.

THE proceedings of the twenty-third annual congress of the British Archæological Association commenced at Wolverhampton on Monday.

At two o'clock the members were received in the Town Hall by the Mayor, and the PRESIDENT, (the Earl of Dartmouth) delivered his inaugural address. After some remarks on the locality selected for this year's congress, his Lordship proceeded to sketch the principal features of the programme of the congress. The first object to which their attention would be directed was the grand old collegiate church, founded in 996 by Wulfruna, who also built a monastery. They might not all be aware of the fact that 200 years after the foundation of the monastery it was not in very good odour with the inhabitants of the town. Dr. Plott recorded that the conduct of the monks was so bad that it drew forth terrible and threatening letters from the King and from the Archbishop of Canterbury, but with very little effect. They would not have an honest man among them, but formed a clerical trades union, and made the life of any obnoxious individual so unpleasant that he had to resign. One of their visits would be to Lichfield Cathedral, and he had no doubt that when they saw the grand west front of the edifice disfigured, as he must call it, by stucco, they would join with him in the hope that the day was not far distant when it might be replaced by solid, durable stone. At Lichfield they would see a plate on one of the houses, marking the spot on which Lord Broke, of the Parliamentary army, fell from a bullet fired by Colonel Dyott from the tower of the Cathedral. Last winter the buff coat stained with the blood of Lord Broke was destroyed, with many other interesting relics, by the fire at Warwick Castle. On the occasion of their visit to Boscobel there might be some warm arguments, and bets of gloves and other light articles, as to the Royal Oak. He might inform them, on the authority of Dr. Plott's history of Staffordshire, that the original oak had fallen down some years before he wrote—that was in the 17th century—and that the present tree was raised from an acorn which was set there. His Lordship next proceeded to invite the Association to his residence at Patshull, and to mention some of the objects of interest which they would see there and at Pattingham. He hoped that that part of the Midlands might be visited by the Association a second time, and that then, among other places, they would be able to visit Aston Hall.

A vote of thanks having been moved to the Chairman, the members proceeded to the Collegiate Church of S. Peter, where the Rev. W. H. KAY read a paper prepared by Mr. W. Parke. The author remarked that of the foundation of a church in Wolverhampton nothing was known till about the middle of the seventh century, when Wulfere, King of Mercia (657-675), became a convert to Christianity, and an active promoter of the true faith. On the recommendation of Theodore, Archbishop of Canterbury, he appointed S. Chad, who had retired from the see of York, to the bishopric of Lichfield, and empowered him to build churches and monasteries in various parts of the kingdom. From this circumstance it may reasonably be presumed that Wulfere, who might have had a residence here, was the founder of the first church in Wolverhampton; and that the town derives its name, or part of it, from him. Long before that period there stood upon the hill of Hantune a Druidical temple, probably nothing more than a rude mixture of timber and wattle. But whatever it may have been, there could be little doubt that, under the influence of Wulfere, it became a place of Christian worship; and the stately church of S. Peter was afterwards built upon its site, or very near to it. It was not known how soon after this period an edifice of a more durable character was erected for religious worship, but it was certain that a church or monastery was established here many years before Wulfruna's endowment (after an archbishop's permission given to her), in honour of the Blessed Virgin. The endowment of Wulfruna was for the maintenance of a dean and secular canons, and was made at three several times, the first in 996. The monastery she erected was attached to the church then standing. This establishment was conferred by William the Conqueror upon Sampson, his chaplain, afterwards Bishop of Worcester. During the troubled time of Stephen, Roger, Bishop of Sarum, and Chancellor and Treasurer of England, seized, probably with the connivance of the King, the church and revenues, part of which he alienated for ever; but being imprisoned on a charge of high treason, he restored as much of the revenues as remained to the monks of S. Mary, Worcester, who were unable long to maintain their rights, which were transferred to the Bishop of Chester. The King very soon after, being convinced of his own injustice, revoked the gifts and again restored to the monks of Worcester the church revenues of Wolverhampton. Henry II. granted two charters to the dean and canons, which conferred upon them important privileges and liberties, and largely increased their possessions; but while the revenues of the church were in this flourishing condition the canons, became notoriously wicked and dissolute in their lives, as described by Peter Blesensis, the dean, in his well-known letter of complaint to Pope Innocent III. After many expostulations and fruitless endeavours to reform them, Blesensis resigned his deanery into the hands of Hubert Walter, Archbishop of Canterbury, who, after a visit to Wolverhampton, and finding the charges against the canons substantiated, proceeded to break up the establishment and replace the expelled canons by appointing regulars, who might be responsible to himself. He therefore obtained permission from King John to found a Cistercian abbey in the place of the dissolved college. The King gave the manor of Tettenhall, and made several grants towards the erection and support of the monastery. But, the Archbishop dying in A.D. 1205, before he had completed his intended work, his successor, Stephen Langton, restored the secular canons, and the monastic institution was abandoned. In the reign of Henry II. the church was enlarged, and the designation of S. Mary changed to that of S. Peter. About this time, a chantry chapel was built by Henry Prestwood, and endowed with land for the support of a priest. Two centuries later, Edward III., in 1338, confirmed the charter of privileges by the charter which constituted the dean, eight prebends, and the sacrist. The dean, Hugh Elys, in 1342 procured from the King a writ for a commission to report on the state of the King's Free Chapel, which was found to be in a most dilapidated and ruinous state, and at once applied himself to its restoration, and from his persevering efforts the present magnificent structure arose. The then existing church was converted into a chancel, and the nave and the stately porch were added to it. The pulpit was, according to Dolman, erected in 1480. Edward IV. annexed the Deanery of Wolverhampton to that of Windsor, and they continued to be united until the reign of Edward VI., when the revenues were given to John Duke of Northumberland, who broke up the establishment, took down the images of the saints, to whom the different chantries, chapels, and guilds were dedicated, and removed the high altar, which had but a few years previously been erected at very great expense, at what expense might be inferred by the fact that merely towards the gilding of it Nicholas Leveson gave £40. Queen Mary, by letters patent, again annexed the Deanery of Wolverhampton to the Deanery of Windsor. These letters patent were further confirmed by Queen Elizabeth, and afterwards by James I. It was not until the revolutionary war in the reign of Charles I. that the church was again desecrated. This took place when the town was in the possession of the Parliamentary troops, who smashed the painted windows, tore up the brasswork on the tombs, destroyed the organ and the costly altar, and pillaged and took away all the ancient records, deeds, and other documents belonging to the college. They also destroyed a noble black marble tomb, erected near the high altar to the memory of the renowned Admiral Sir Richard Leveson; but the fine bronze statue which formed a part of it was fortunately saved by the forethought of Lady Catherine Leveson, who had it removed to Lilleshall Church, where it was preserved till the Restoration, when it was brought back and placed in a niche in the great chancel. Here it stood till it was removed in 1840, by direction of the late Duke of Sutherland, into the south transept. It was probably from the connection with the Royal Chapel at Windsor that the church remained undisturbed at the period of the Reformation, and that when the "rood lofts and other relics of idolatory," as they were termed, were ordered to be removed, the churchwarden should refuse to carry out the directions which the dean had issued, the penalty of excommunication notwithstanding. The rood loft was, however, taken down in 1572, when galleries were built, and pews introduced into the church. To these particulars, many of which had been supplied by the excellent historical account of the Rev. Frederick Hall, and the more elaborate work of Dr. Oliver, little had now to be added. In 1544 the church was filled up with 16 stalls, which were sent by Mr. Walter Leveson from the dissolved monastery of Lilleshall. They were for the dean, seven prebendaries, a sacrist, three readers, and four singing men. There were other stalls at the east end of the nave for the clergy and choir, with canopies over three of them, which remained till the new galleries and pews were erected in 1837-8. The communion plate was presented to the church in 1713, by the Dean, Lord Willoughby de Broke. In 1540, three bells, which had been purchased from Wenlock Abbey, were hung in the tower, and the peal was afterwards completed at various times. The latest restorations of the church were commenced in 1832, and completed in 1865, when the chancel was rebuilt, with the addition of an apsis, Mr. Christian being the architect. The Ecclesiastical Commissioners granted £3,000 towards the repair of the nave, and £1,000 for the chancel, to which the Duke of Cleveland gave £1,000. The rest of the money, amounting to not less than £8,000, was contributed by the inhabitants of the town and neighbourhood. To this account of the various vicissitudes and changes the church had undergone, it was satisfactory to add that a movement was being made for the further improvement of the interior by the taking down and remodelling of the galleries.

Mr. Parke's paper was to have been accompanied by a paper from Mr. Ewan Christian, on the same subject, but the Rev. J. H. Iles announced that Mr. Christian had neither arrived nor had he sent a paper. In the place of it Mr. Iles read a report some time ago prepared by Mr. Christian, in whose hands the restoration of the church has been placed. This paper Mr. Iles interpolated with explanations, the result of later information than Mr. Christian possessed when he wrote his report. In reply to Mr. Edward Roberts, one of the general secretaries, Mr. Iles gave the dates of the inscriptions on the bells that it had been supposed came from Wenlock Abbey (of which structure Mr. Roberts had written the history), and it was shown that they were made in Gloucester at a later date than the dissolution of the Abbey.

Mr. Edward Levien, the other hon. general secretary, gave a rapid sketch of the opinions he had formed of the Churchyard Cross, the history of which has hitherto been a matter of so much doubt, but which is of so much significance in the borough as to occupy a prominent place in its escutcheon. He was followed by Mr. Gordon M. Hills, the Hon. Treasurer, who, after a thorough examination of the pillar, has arrived at the conclusion that it is not of Danish origin, but Christian, of the Norman period, probably the twelfth century. The author had traced upon it the ox of S. Luke, the lion of S. Mark, the angel of S. Matthew, and he thought he could trace the sign of the fourth Evangelist, whilst he believed that there had been a fifth figure, which probably was the Crucifixion. On the top of the pillar as it now stood there would have been another stone, pyramidal in form, surmounting which there would, in the completed state of the whole, have been a cross.

From the church the party proceeded to Major Thorneycroft's residence at Tettenhall, where refreshments were partaken of, and afterwards Tettenhall Church was inspected, under the guidance of the Hon. Charles Wrottesley. The living was bought by the Wrottesley family at the time of the suppression of the original structure, in the reign of Henry VIII., and it was now in their possession. The east window dates from 1200, and there was only one other specimen of the kind in England.

Mr. Roberts dwelt upon the beauty of the window, drew attention to an incised alabaster slab in the Wrottesley Chantry (which Mr. Wrottesley said was of the date 1517, as the record showed), and spoke of the excellent state of preservation in which the Association found the church and everything in it. The mission of the Association was to induce people to take care of precious relics, or, in such cases as Wolverhampton, to induce the people in other places to do as the inhabitants of that locality were doing. Mr. Wrottesley explained that the handsome tomb slab, to which Mr. Roberts called attention, had been recently restored. Under the guidance of Major Thorneycroft, the visitors viewed the yew trees in the churchyard, one of which was, he said, supposed to be 800 years old.

On Tuesday, about fifty members and friends went by rail from Wolverhampton to Brownhills, where, alighting, they rode to Wall—as the crow flies, not more than a mile and a half from Lichfield. Wall is known to have been built pretty much upon the site of the ancient Roman town of Etocetum, and the church of Wall is believed to stand upon the eminence on which, during the Roman occupation, there stood the Temple of Minerva. After the martyrdom of S. Alban the Christians fled from the city of that name to Christians' field, near Lichfield. Here they were slaughtered, it is inferred, by the Roman soldiers who were garrisoned at Etocetum, Lichfield rose out of that massacre, and from it derived its name. Thus Wall was when Lichfield was not; and as Lichfield rose upon the ashes of the fugitive Christians, so Wall rose upon the ashes of Etocetum—for excavations recently made leave little room to doubt that Etocetum shared the fate of most Roman cities in Great Britain, and was sacked and burnt.

Arrived at Wall, the visitors were conducted by Mr. G. R. Wright to the excavations, which are at present being conducted in the meadow below the church, which itself occupies a considerable eminence. Here they were met by Mr. Bagnall and by Mr. W. Molineaux, who is associated with Mr. Bagnall in making them. After the company had examined the excavations in the meadow, with the shreds of pottery, the tiles, the bones, the flat-headed nails, and the like, Mr. Molineaux read a paper on the excavations, in which he said that Etocetum was one of the two large military stations established by the Romans in Staffordshire, and probably succeeded the subjugation of the people of the surrounding country. How, after the departure of the Romans, it became a buried city was unknown. The word Wall applied to it by the Saxons showed it had not been occupied by those people, and was evidence of its early ruinous condition. The probability was that during the wars to which Roman Britain was subjected the place was destroyed or rendered unserviceable. From its evacuation by the Romans to the first decade of the 17th century, it ceased to hold a place in contemporary history. Camden spoke of a visit to it in 1607, and it was subsequently examined and described by Plott and Shaw, and other historians. Plott saw ruins of walls equidistant 12ft., and 12ft. high, and 3ft. thick, in a field called "The Butt," the site of the present excavations. The villagers in Plott's time believed in the ruins of a temple in the neighbouring field. Plott had no doubt that at one time there were houses all the way from the then remains of the castle to the brook. To Mr. Garner, F.L.S., the well-known naturalist and historian of the county, was due the credit of first suggesting a systematic examination of Etocetum. About fourteen years ago that gentleman showed by the results of a few days' excavations what might be accomplished. After describing these results, Mr. Molineaux went on to say that a few days since the present excavations were commenced in the Castle Croft. One excavation had laid open a small chamber, and this and the other excavations corroborated the statement of Plott that there were houses the whole way between Castle Croft and the brook. As yet they had met with no coins, but samples of Samian ware, black, brown, and red pottery, both plain and ornamented, thick quarries a foot square, roofing tiles, plaster with floral designs, lead drain pipes, bones of deer and wild boar, together with blocks of cement made up of pounded brick and lime, which he had identified with the limestone of Walsall, had been found. They had also laid bare the wall from which the village derived its name, and found it built externally of sandstone laid in regular courses and filled in with coarse cement. It was three feet thick, and ran due north and south. In the orchards they had also laid bare the south wall of the Castle. They hoped to follow both that and the western wall till they came to one of the gateways by which the town was entered. The present excavations were merely preliminary, and the work would probably occupy a considerable time in carrying out; for there was no doubt Etocetum extended from near Pipe-hill to Chesterfield, having a frontage to the west of over a mile. Supposing it extended to the eastward half that length, they would have no difficulty in arriving at an approximate notion as to its extent, population, and importance. They were looking forward to the discovery of the cemetery with much interest. They expected to find it at the intersection of Watling and Icknield-streets, just outside the town. It was also intended to push on the investigations to Chesterfield, and to unravel, bit by bit, the wonderful history of the place, and to show that they had in Staffordshire as interesting and important a Roman antiquity as Uriconium.

The party now proceeded to the orchard, where they saw an excavation that had laid bare a portion of the boundary wall, where the foundation, that of a buttress, was 9ft. thick. As many as 120 yards of the wall had been exposed.

In the church Mr. Bagnall narrated the legend of the history of its site. The members resumed their vehicles and rode off to Elford Church, the first two miles of the distance along Icknield-street, where they were met by the rector, with the Bishop of Honolulu, Mr. Bagnall, Mr. Molineaux, and others. Mr. Paget, notwithstanding the illness from which he is suffering, conducted the visitors over the church, and, in the absence of Mr. J. R. Planché, who was to have given a description of the renowned effigies there, himself stated what was their history, and to whose memory they were erected. He spoke of the tomb of Sir Thomas Arderne (date 1400), who accompanied the Black Prince to Spain; of Sir John Stanley (1474); of the child, John Stanley (1470), who was killed by a tennis ball; of Sir William Smyth (1525), and others. Subsequently the Association drove on to Haselour Hall, the residence of Mr. John Nevill, where they were entertained at lunch. After luncheon, Mr. Nevill described how he had restored the splendid old mansion, over which he then conducted them, as also over the attached chapel. From Haselour Hall the members drove on to Lichfield, where tea was obtained at the Episcopal Palace, and then the Cathedral was described, both externally and internally, by Mr. Gordon M. Hills, the hon treasurer.

ESSEX ARCHÆOLOGICAL SOCIETY.

THE annual gathering of the Essex Archæological Society was held at Maldon on Thursday week. The proceedings commenced with a general meeting in the large room of the Public Hall. The Bishop of Rochester presided. From the twentieth annual report of the Society it appeared that there was a balance of £120 at the bank. The number of members was 173, showing a loss of 17 since the last revision. The museum at Colchester had been greatly increased during the year by valuable gifts of coins, medals, and various objects of antiquity. In 1870 the number of visitors was 10,155; in 1871 it was 13,969; and during the past year it was 14,780. The report concluded by an appeal for increased support. The Rev. E. R. Horwood then described the old church of All Saints, Maldon, and the ancient history of the town itself. For the triangular tower of the church he claimed that it stood unique in Christendom; while, for the town, he advanced its claims to be considered the *Camulodunum* of Roman days, in preference to Colchester. Against Colchester he alleged its fortifications, its name, the character of the remains found there, the fact that it was never burned and sacked, and other circumstances inconsistent with its claim. In favour of Maldon he quoted many facts, dwelling particularly upon its situation, the remains discovered, and a brief of Charles I.'s time in which the town was regarded as the old *Camulodunum*. The Bishop, in closing the meeting, deplored the fact that this interesting and useful Society had only 173 members. In Kent an Archæological Society had a thousand members; in Sussex there were as many; and even the Surrey Society, which was quite a young one, had more members than this. The history of the most ancient inhabitants of our land was very much bound up with Essex, and it was a pity that the spirit of archæology should not be much more dominant in the county. The party then partook of luncheon. Afterwards, the churches in the town, Dr. Plume's library, Beeleigh Abbey, the site of Woodham Walter Hall, Danbury, Little Baddow, and the priory church of Hatfield Peverel were visited, a paper on the latter being read by the Rev. T. Debary. It has been decided that next year's meeting is to be at Dedham.

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OPPORTUNITIES.

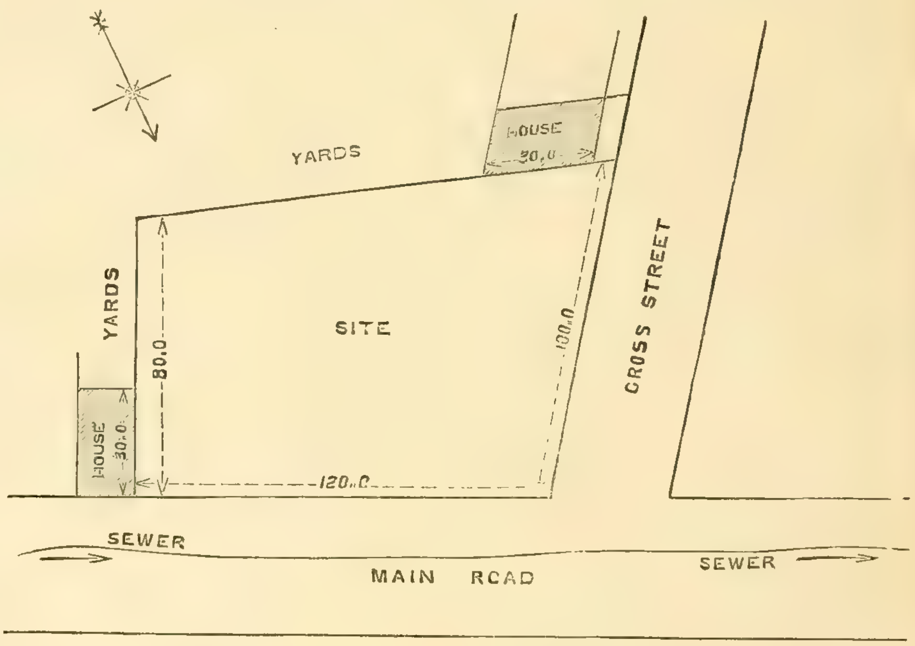
A CORRESPONDENT of the *Times* says:—It is not often that individual Englishmen have the means of immortalising their names in great public movements. One such, no doubt, is the completion of S. Paul's Cathedral. But there are two other like opportunities in counties almost adjacent to London. One is Hertfordshire. There is the great Abbey Church of S. Alban's; second only in historical interest and architectural grandeur to the chief Cathedrals and Abbeys of our country. It has hitherto depended for its support and restoration on the inhabitants of a humble provincial town, but has now appealed to a wider range. Let every one who wishes to learn what ingenious preservation can do for Roman, Saxon, Norman antiquities, go and see the efforts now making at S. Alban's. The other is Bedfordshire. It is the fragment—but still the magnificent fragment—of the old Priory Church, now the parish church of Dunstable. Its historic recollections and artistic splendour, though not equal to S. Alban's, are of a very high order, and, like S. Alban's, it has hitherto been supported by the population of a comparatively decayed and insignificant town. The local efforts in both these places have been laudably energetic. But they belong to that class of movements which require efforts, not of a local, but of a national kind—not of a small, but of a great character.

Another correspondent, in speaking of Dunstable Priory Church, says:—Within the last few years the British and other Archæological Societies have visited the church and expressed their admiration of the manner in which its many beauties had been dealt with. The Restoration Committee have been engaged in a labour of love, and have spared no pains on their work. The clerestory has been cleared of the rubble with which it had for years been choked; a unique and graceful west window has been similarly restored. The south aisle is now as fine a specimen of Norman work as is to be found in the kingdom, and the new oak roof is worth a visit to Dunstable to see. There yet remain the north aisle to restore and an east window to open, but the work in hand is that immediately necessary to enable worship to be held regularly in the church. Let me add that Messrs. Bassett & Co., Dunstable, are the bankers, and will gladly take charge of any contributions.

PROPOSED COMPETITION FOR A SCHOOL DESIGN.

IN obedience to a promise given a few weeks since we beg to offer prizes for the first three best designs for schools.

The design is to provide for 700 children in three departments—viz., 260 infants, 220 boys, and 220 girls. The infant school is to have a general room for the assemblage of the whole department at one time, and two class-rooms—one for 60 children and one for 40 children; the area of the school and class-rooms together to be not less than 9ft. superficial per child. The graded schools to have *each* a general room for the assemblage of the department at one time, also two double class-rooms so arranged that they may be thrown into one, each class-room to be constructed for 30 children, and the area of the general schools and class-rooms combined to be not less than 9ft. superficial per child. Separate cap and bonnet rooms, and lavatories and water-closets, to be provided for each department. Provision to be made for care-taker's residence. Also for one drawing class-room. Playground to be provided for the infants. The buildings are to be suitable for erection in a large town. The site is shown on the accompanying plan, on which the dimensions and cardinal points are marked. The land has a uniform fall of 3ft., from cross street eastward, in its total length. The design is to conform to the "Rules to be Observed in Planning and Fitting up Schools," issued by the Committee of Council on Education (see the **Building News** for Feb. 23 last), and to the "Rules to be Observed in the Planning and Fitting up of Schools," issued by the School Board of London, as revised and re-issued June 12. Where these differ—*e.g.*, in the width of schools—the competitors must follow the rule of the Committee of Council on Education.



The geometrical drawings are to be all mounted on one sheet of *double elephant* paper. They must include a plan of each school, two elevations, and one section, to the scale of one-twelfth of an inch to a foot, a block plan showing drainage and approaches to a scale of one-thirty-sixth of an inch to a foot.

Each design must be accompanied by an estimate based upon the cubic contents of the building taken at 5d. per foot, not including fence walls, playgrounds, and heating apparatus; and the competitor is requested to add his own estimate of the cost of benches, desks, and book-closets. No design is likely to receive a premium which is manifestly too elaborate to be executed under favourable circumstances at the rate named herein. The estimate is to be accompanied by a statement of the cubic contents of the building measured from 3ft. below the finished level of the playgrounds to half-way up the roof, and the dimensions and calculations upon which this statement is based are to be furnished.

A short written description may accompany each design, explaining any point of arrangement or construction which the competitor considers it desirable to describe.

Each design, and also each estimate and report, must bear a motto; and a closed envelope marked with the same motto, and containing the name and address of the competitor, must accompany the design. Designs will be received up to October 31, 1872, at the office of the **Building News**. The Editor of the **Building News** is to have the right to reproduce any of the designs submitted, retaining the drawings for that purpose as long as may be necessary.

No design can receive a prize which is not prepared in a manner suitable for reproduction by photo-lithography, consequently the drawings should have well-defined lines, and should not be shaded with Indian ink or tinted with flat washes. Colours should be avoided, and smooth paper should be used.

The judges (hereafter to be appointed) in making their award will consider (1) arrangement, (2) lighting, (3) ventilation, (4) economy, (5) architectural treatment, and (6) draughtsmanship, as well as conformity to the official rules referred to above.

The prizes will be £10 10s. for the best design, £5 5s. for second best, and £3 3s. for the third best.

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DESIGN FOR TOWN HALL.

SOANE MEDALLION PRIZE.

WE are enabled, by permission of the Council of the Institute and the author, to give this week two of the Soane Medallion Prize Drawings, as submitted by Mr. Alfred Redding this year. For conditions of this annual and principal students' prize see **Building News**, page 450, June 9, 1871. Next week we shall give elevation details and plans of the same design, and no doubt when we have done so our readers will say that Mr. Redding richly merits the coveted prize.

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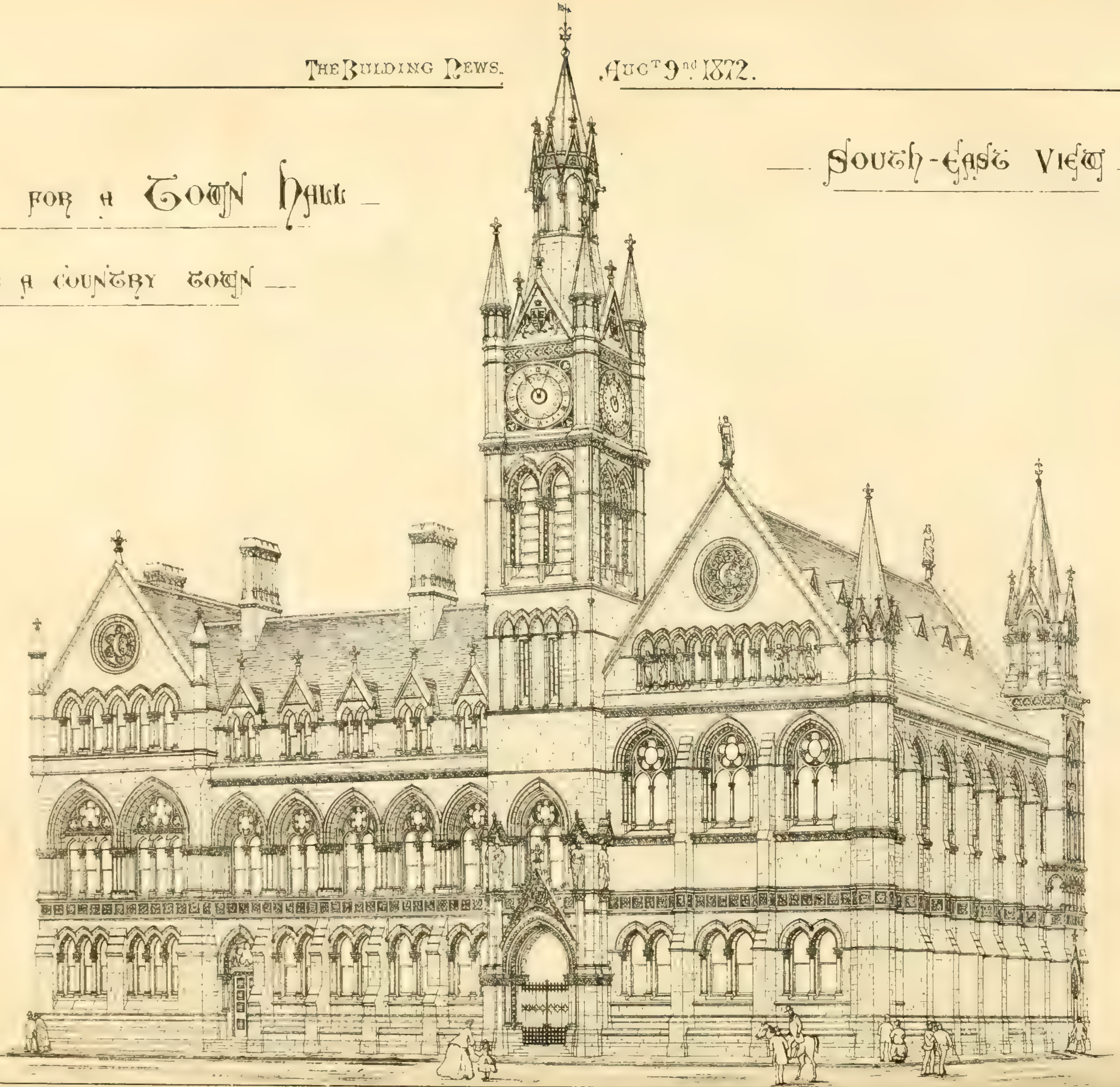
Accidents by Lightning.—During the storm of Wednesday the Church of S. Giles, Cripplegate, was struck by the lightning. The flagstaff was severed, but no serious damage appears to have been done. The lofty tower of Holy Trinity Church, Windsor, was struck by lightning in several places. The electric fluid shattered the arch of a large window in the belfry on the south side, breaking away a considerable portion of the masonry. Damage was also done to the north side of the tower, and the electric fluid passed through a circular window below, melting the lead, and destroying the glass. The lightning appears to have struck the exterior of the belfry in different places.

Design for a Town Hall

For a Country Town

South-East View



Steadfast

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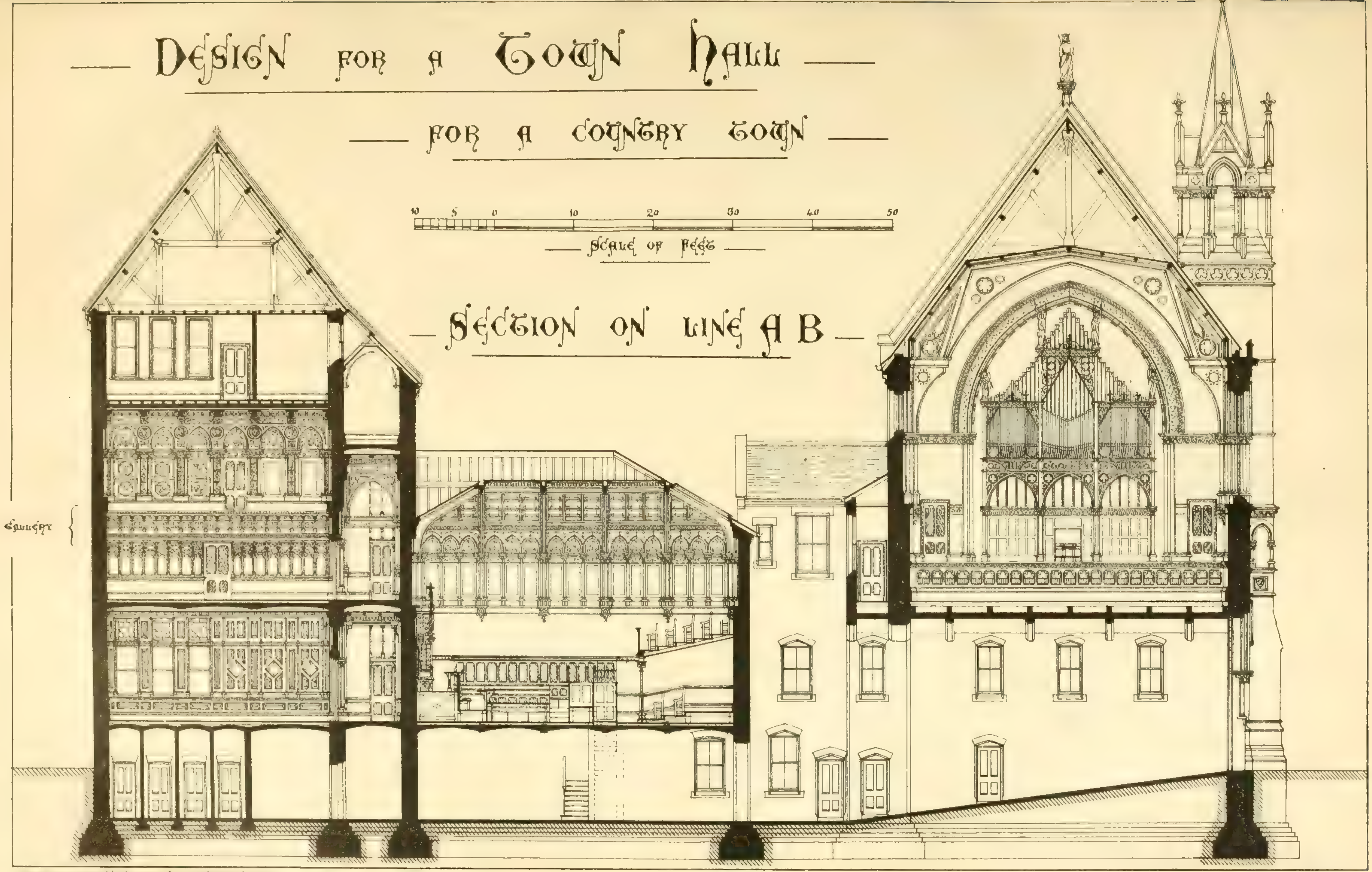
DESIGN FOR A TOWN HALL

FOR A COUNTRY TOWN

SECTION ON LINE A B



[illegible] Nutteman & Baus 23, Holborn, London

Steadfast

FASHIONABLE ART AND ITS PROFESSORS.

THE contradictory and unsettled state of architectural art, its want of accord and sympathy with scientific progress and modern society, and the conflicting views held by some of its leading professors, are nowhere better reflected than in the columns of the architectural press, especially in the wide-spread pages of the BUILDING NEWS. Side by side with notices of improvements in construction and art appliances we find glaring inconsistencies of design and ideas of art propagated. The wrath of writers—"E. W. G.," "J. P. S.," T. Gildard, and "A Layman," to wit—is a righteous wrath; but it has been again and again expended by others with, at present, no result. The root of the matter is the education which our architects receive, and under which it is impossible to produce a race of independently-minded, competent, and original thinkers or artists. No other profession but the "architectural" is so ice-bound and trammelled by precedent, custom, and conventionality: no other so cramped in the application of scientific principles and knowledge. We are passing through a stage of antiquarian deadness—those types and models being chiefly copied which have been favoured or selected by certain popular well-to-do architects, irrespective of any merit or suitability in them. We are not even catholic enough to take the whole scope which one great school or style affords, such as the Gothic or Classical, but must needs limit our models to those of a particular country or period. So much for taste! But we are none the less slavish in our adherence to old arrangements and old types of construction. Our new churches are almost all planned—in deference to Ritualistic ideas—with long narrow aisles or vistas separated by pillars, the congregational idea being entirely neglected, and unlucky the architect who, when he needs a Church Building Society's grant, unwarily uses his own judgment and taste. He must regulate his plan by certain rules, and in taste and construction he must consult the oracle of the Society or the clergyman's whim. He is tied head and foot. But to what? it may be asked. Not to regulations or rules founded on knowledge of modern requirements, of science or experimental data, but to precedent, to fashion, or to ritual.

It may be questioned here to what extent are architects responsible? Are they not simply the passive agents of this fashion or custom? To a certain extent the majority of the profession is, it must be confessed, in such a position. But the fault lies with themselves. Instead of inventing and devising, they *will* copy, and have become a set of mannerists copying this or that school, or being led by a fortunate brother. As long as the profession will follow, there cannot be any art; and the public taste, instead of being influenced by the profession, is either led by one or two fashionable exponents of it, or becomes disgusted with the archæological resurrection which is called architecture. The fact is, the architect's education is so deplorably defective in all that relates to modern life and art appliances—so confined and coloured by the measurements and study of old examples—that it is impossible to expect that recognition of our services from outsiders which other professions receive and claim as their due. Practical utility, fitness, proportion, and other qualities of art are virtually ignored, and in lieu of them, antiquity, ornament, and literal reproduction are counted merits. We are too critical as copyists, not critical at all in essentials. Illogical in the extreme, we neglect the basis of all art, its bygone conclusions only being accepted without proof. Where, alas! would our science, our legislation, be under such a process?

G. H. G.

MR. PENROSE'S DESIGN FOR THE DECORATION OF S. PAUL'S.

"FAIR play is a jewel," and this we cannot think that Mr. Penrose has met with as yet at the hands of the Committee for the Decoration of S. Paul's Cathedral. That the Surveyor to the Fabric should have been instructed by the Cathedral authorities to prepare a design, and been engaged upon it for years, making elaborate and costly models to a large scale, and a profusion of drawings, and that this fact has been unknown to or ignored by the Committee more recently formed for the carrying out the project of decoration, is, to say the least, unaccountable. Whether or not Mr. Penrose was asked, after another line of conduct had been determined upon, to submit what he had in hand to a recent meeting is not to the purpose. His work was then and is still unfinished, and altogether too bulky, not to say important, to be treated in so off-hand a manner. The labour upon which he has been so long engaged (we know not if it be entirely at his own cost) is in so forward a state that its completion is a matter of a few weeks or months at most, and we have no hesitation in saying that it has a claim to be fairly and fully considered impartially and without prejudice by the Committee before any step be taken to supersede it or its author in the appointment he holds. The etiquette of the profession, which we have always striven to uphold, would also demand of any other member of the profession, before undertaking a commission for the same work, to see that the ground is clear, and that Mr. Penrose's design has been finally dealt with in some decisive manner, and his fair claim for remuneration for it settled as a preliminary to any other design being commenced by other hands.

So much is due to justice. The endorsement or further prosecution of the design is another affair altogether. The Committee comprises men fully able to judge of its merits and demerits, and it is not without either; the question is whether the merits outweigh the demerits, and whether the latter are inherent to the design, and incapable of amendment. We are fully aware that the contemplated work is of vast importance, and that upon a right decision hangs the immediate future of the decorative art of England. If, then, Mr. Penrose's project be deemed (though worthy in itself of much praise, which we would willingly accord to it) not the best which the age has a right to demand, let the patient labour which has been bestowed upon it be properly and thoroughly remunerated; let the models and drawings become the property of the Committee or the Chapter, and be used, as they may be with advantage, as a starting point for instructions for a new design.

The great difficulty under which it appears to us that Mr. Penrose has laboured, and under which any other architect must labour for some time to come, is the want of artistic seconding. There is a point where the architect, however artistic, must surrender the work into the hands of artists, when they, and not he, are responsible for the separate pictures or portions of the work. Here it is that the designs before us mainly fail, and Mr. Penrose to a certain extent becomes the victim of the perversion of their powers, from which even our first artists seem unable to emancipate themselves. The wrongheadedness of the last three centuries ushered in by the Rennaissance seems to paralyse the efforts of even such men as Watts and Stevens, and to blind them to the very purpose they have to effect. Any scheme must fail in effect which is based upon such erroneous notions of what decorative art should be, as to include such a sprawling abortion as the figure of Isaiah, who, as if shortsighted, is poking his nose into a slate held at an inconvenient distance from him by a provoking angel; and many of the spandrels, designed but not executed, are more ungainly and ill-outlined than this, and all show the same fundamental error of treating the spandrel so as to destroy it as wall space.

But, then, as matters stand, how can we assume that if an architect direct the attention of the artists, to whom he must delegate the execution of the pictures he spaces out, to the works of the earlier Pre-Raphaelite painters, who were right in principle, if feeble in their carrying them out, that he will succeed even so far as to be understood by them? We happen to know that many able artists, who earnestly desire such an opportunity, and are prepared to do decorative work almost gratuitously, are not to be bent from their preconceived notions and practice in which they have spent their days, and no artist of ability would consent to be dictated to, so that a new school must needs be raised up for the purpose. Mr. Street has proved powerless to control Mr. Watts at the church in Garden-street, Westminster; and Mr. White alike unable to direct Mr. Leighton at Lyndhurst Church. Mr. Penrose, also, we must own, has not shown us in his models that he even appreciates the misdirection in which those able men employed under him have wandered, since all the sketches exhibited are of the same character throughout.

It is, then, to the architectural polychromatic treatment that we now propose to turn our attention, with regard to which Mr. Penrose says, "Quite irrespective of the question of cost, there seem to be only two ways of ornamenting such a building as S. Paul's: one, that of profusely covering every available space from vault to pavement with subjects combined with enriched material or ornament; the other, that of concentrating the chief attention on certain points, and leaving much of the framework of the building unaltered, proper care being taken to connect the ornamented portions by adequate but subordinate embellishment. In designing the scheme, of which a considerable part is now submitted, conformity with the last-named principle has been aimed at." It appears that Mr. Penrose, in the first instance, tried the effect of the first class of treatment, and deliberately abandoned it. Of the two systems, the method in which S. Peter's at Rome is treated is of the latter and lighter character, while S. Mark's Cathedral at Venice may be cited as an example of the former; and an instructive contrast of the two is to be found in that of Parma, where the nave and chancel are differently treated, one on the former, and the other on the latter. It is obvious that the style of architecture of S. Paul's more nearly corresponds with that of S. Peter's, and is wholly different from S. Mark's, and in Parma the choice would certainly lean to the one to which Mr. Penrose has now given his adherence. Such deep and strong colouring as we see in the Venetian example is intolerant of anything but plain surfaces, and the projecting orders of S. Paul's would not be in harmony therewith.

We incline, therefore, to agree with the selection of the principle alluded to, in which the four main points upon which the ornament has been concentrated are

1. The choir, including the apse and the baldachino.
2. The dome.
3. The painted windows at the ends of the four arms of the cross.
4. The smaller dome at the west end of the nave.

The choir is intended to be, as it should be, the richest in treatment. The domes in each bay of the ceiling are gilt and enriched with colour, in somewhat too small masses, and these lead up to a figure of our Lord in Majesty at the end over the baldachino. Much of the stonework of the lower portion being left plain, the amount of gilding above seems somewhat heavy. It is true that a border of white is carried round the outer moulding of these domes, but we think that the main constructive lines of the ceiling, the transverse arches and great bolection mouldings of the domes, should be white touched with gold rather than gilt, and that this would carry harmoniously throughout the main architectural lines in the same key, and tend to general lightness of effect.

It is, perhaps, out of place here to remark upon the position fixed by Mr. Penrose for the baldachino at the east end of the chancel in front of the apse. We cannot, ourselves, question that this must have been the intention of Wren; and to sever the whole chancel from the body of the church, and heat it as a small chapel for daily service, as proposed with much ability in the *Sacristy*, seems to us an unnecessary sacrifice of a large integral portion of the building from the general effect. The baldachino itself, designed by Mr. Penrose, is as close to the description left in the "Parentalia" and an imperfect model that Sir Christopher Wren proposed as possible, and is graceful and dignified.

To proceed to describe Mr. Penrose's views in his own words: "The connection between the parts more elaborately treated is looked for from the vaulting, which is to be richly worked in Mosaic throughout (although colour is to be used prominently in the choir and the dome), and from the pavement, and the attic panels, in which a good deal of marble inlay is contemplated. Ceramic ornament might, however, be partly substituted for marble inlay in the attic panels." If the vaulting is thus to be the principal feature we seem to desiderate for its design a broader and clearer treatment, less ornamental, perhaps, and with more field for pictures of the right sort.

The introduction of marble into the construction Mr. Penrose proposes to confine to those portions of the apse which Wren himself painted in imitation of marble as a confessedly temporary expedient, but this would necessitate carrying out the same treatment to some extent along the choir, but no further. The principal cornice and pier arches and their supports are intended to remain plain Portland stone as at present. Some marbling to the panels and plinths Mr. Penrose thinks requisite, but against marbling of any sort we protest energetically; the gilding he speaks to the arch-soffits is permissible. No doubt the object to be aimed at, and one which we see some little difficulty in realising, is "to connect the rich work in the vault and clerestory with the pavement with no great alteration of the existing framework." We have already suggested as one means of doing this the tempering of the proposed richness of the vaulting by leaving white some of the principal constructive features of the ceiling.

As respects the windows, continues Mr. Penrose, there are the east end eight windows, five already occupied. These, however, are so indifferent that all connected with the work may rest assured that nothing less will be satisfactory than the removal of those now there, and the bolder treatment of the whole. The six windows of the transept are fortunately all unoccupied.

The dome is exhibited by a model to a scale of half an inch to a foot, and a careful drawing. Of the spandrels we have already spoken. The figures in the cupola are proposed to be by Mr. Woodington. The subject represented is the "Te Deum." There are two main horizontal lines of pictures, with eight compartments in each. In the N. W., N. E., S. W., and S. E. compartments of the lower range, three apostles in each, are seated at the twelve gates of Jerusalem. The compartments towards the cardinal points are devoted to the prophets and martyrs. Above are the angels, cherubim and seraphim, and powers of heaven represented by angels, bearing the signs of the sun, planets, and stars, and these, with the worship of the Cross and the Lamb, occupy the eight compartments of the higher range.

In a continuous band round the opening of the dome, above the comprising arches of the aforesaid panels, is a ring of angels and blessed spirits playing on various instruments of music, or singing, "Holy, Holy, Holy, Lord God of Sabaoth." The idea of all this is better than the individual treatment suggested, in which the figures are too crowded, and the design not simple and clear enough; but, as we have said before, this, in detail, is, or should be, more the artist's than the architect's province. The arrangement of the enclosing arcades of the lower compartments is intended to be executed in mosaic. The manner in which the piers seem to converge is hardly pleasant, and the lines might be revised with advantage. Through the opening in the crown of the cupola or dome, the interior of the cone, which would be visible, is simply intended to have gold stars on a blue ground; but to it, and to all the blue shown on the drawings, care would be necessary to avoid the crude rawness inherent to all modern dealings with that dangerous colour, the effect of which is not absent in the model and drawing we are referring to.

Of the interior Mr. Penrose further remarks that its treatment, "while preserving the general framework of the architecture with little alteration, offers very considerable and probably sufficient spaces for iconography—*i.e.*, arrangement of subjects; for in addition to the figures proposed for the apse and choir, the great west door, if covered, as proposed, with bronze, admits of a great series of Biblical subjects. The exterior might well be devoted to the History of S. Paul, and the interior to the Acts of the Apostles."

The western dome it is proposed to decorate in illustration of the Creation, the north and south chapels with subjects from recent ecclesiastical history. Twelve panels in the nave, eight in the transepts, and twelve in the choir on each side of the aisle windows, are suggested as suitable places for historical subjects in bas-relief, and there are further spaces below for monumental subjects; and there are, besides, twenty-two windows, some, of which, unfortunately, have received scriptural subjects, and perhaps the utmost that can now be hoped is that these may not be suffered to rule the rest.

In conclusion, we again express our opinion that the first step to be taken is to give this series of models and drawings that has been prepared by Mr. Penrose that free and full consideration which it cannot be disputed it deserves. In any case, they will be useful to assist the Committee in their deliberations, and enable them to realise the effect they desire, and to give their future instructions to whomsoever in their judgment they may think it best to entrust the actual work itself.

J. P. S.

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LIVERPOOL ARCHITECTURAL SOCIETY'S EXCURSION.

ON Saturday the members of the Liverpool Architectural and Archæological Society held their annual excursion. The party started about nine o'clock, and proceeded *viâ* Walton to Kirkby. At Kirkby the party alighted and visited the new church dedicated to S. Chad, where they were met by the Rev. Canon Hornby, who explained the various points of interest about the church. The building, which was consecrated about twelve months ago, is built in the transition style between the Early English and Norman, the porches on the north and south sides being approached by flights of steps, which add greatly to the appearance of the building. At the west end of the church there is a very old font, surrounded with carved stone figures, variously supposed to be of Norman or Early Saxon workmanship. The party next drove to Aughton, near Ormskirk, to visit a new church just finished, which has been erected under the superintendence of the Messrs. Hay. The church consists of chancel, nave, and aisles, with south porch and large western tower, all constructed of a yellowish local freestone. The interior is lined with solid ashlar, and the floor is laid with black and red tiles. There is a very handsome reredos of Caen stone, marble, and alabaster. The three central panels are filled in with subjects from the life of Christ. They are executed in white alabaster in *alto-relievo*. The pulpit is finished with marble shafts and carved Caen stone. The front panels contain sculptured subjects in white alabaster, also in *alto-relievo*, emblematic of S. John crying in the wilderness, Christ delivering the Sermon on the Mount, and S. Paul preaching at Athens. Round the walls of the nave are carved full-length figures of angels with musical instruments of various descriptions, and in the chancel there are similar figures in Caen stone.

The next visit was to Halsall Church, a very interesting specimen of the Perpendicular period, and possessing an octagonal spire rising from a square tower with exceedingly massive buttresses at the base. A feature of great interest in the church is a turret on the east gable of the nave, used for the sanctus bell. The chancel, which is the part at present being restored, is of a very interesting character to archæologists. There are three full-length effigies carved in marble. The tracery of the east window is of rather unique treatment in the shape of the cusping and the position of the transoms, and on either side of the window is an elaborately-carved niche supposed to have contained figures. The timber of the roof is in some places elaborately carved. After lunch, a rather long drive brought the party to Rufford, where the Old Hall, the residence of Sir Thomas and Lady Hesketh, was visited, and some quaint and rich old carved oak work was inspected, after which a pretty little church was entered and examined. About seven o'clock in the evening dinner was served in the Hesketh Arms Hotel, and was followed by the proposal of several complimentary toasts and the responses thereto. The return journey was commenced shortly after nine o'clock.

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DWELLINGS FOR THE WORKING CLASSES.

THE Metropolitan Street Improvements Act, 1872, provides that certain lands are to be set apart for the erection thereon of dwellings for the working classes. It specifies that the Wapping improvements, the Shoreditch improvements, and the Old-street towards Oxford-street improvements involve the removal of many houses occupied by the labouring classes; and therefore the Board shall, in carrying out the said respective improvements, acquire and afterwards sell or let on building lease in the case of each improvement the several plots of land coloured yellow upon a plan signed by Mr. Charles Edward Cawley, the chairman of the committee, for the erection on such land of suitable dwelling-houses or lodging-houses for mechanics, labourers, and other persons of the working and poorer classes; and the Board shall have full power and authority to make and enter into contracts and agreements for or with reference to all or any of the purposes aforesaid, and to impose conditions and restrictions as to the elevation, size, and design, of the houses, and the extent of accommodation to be afforded thereby; and if any difference arise between the Board and the company or person making an offer in writing for the purchase of the said lots, or any of them, such difference shall from time to time be referred to and determined by an arbitrator to be appointed by one of her Majesty's principal Secretaries of State, and the decision of such arbitrator shall be binding on all parties, and shall be carried into effect accordingly; provided always that if at any time within three years after the Board have acquired any of the before-mentioned plots of land a Secretary of State shall so determine, or at the expiration of such three years the Board shall have been unable to sell or let the same for the purpose aforesaid, the obligations by this enactment imposed upon the Board shall, with respect to the land so unsold or let, cease and determine.

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THE STRENGTH OF BRICKWORK.*

THE torn and ragged keyless arches and baseless walls of our ruined abbeys, the partially demolished houses on the track of some new railway or road, and many other equally trite instances, might be cited as standing evidence of the truth that good masonry or brickwork will resist with energy not only crushing, but breaking across, and tearing, twisting, or shearing asunder. No wonder, then, if the first element alone be included in the calculation, that many a brick structure whose fall has been prophesied refuses to acquiesce in the false laws of the prophet. The prophet's dictum might probably be justified by the result if full work were imposed upon the structure before sufficient time had been allowed for the full development of all the powers of the brickwork, but the experienced practical builder never loses sight of this condition, but by the use of cement in some places, and of props and supports in others, gives the brickwork the necessary temporary aid, and so ensures success.

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* From *Engineering.*

Hundreds of cases might be cited where the structure must necessarily have failed had not brickwork been capable of exerting considerable resistance to transverse strain. As a case in point, illustrative of the fact that a walk through the streets will afford all requisite data, reference may be made to a dwelling-house near Hammersmith Bridge, carried upon a series of very flat elliptical arches springing from piers about 12ft. in height, and averaging only 18in. square. Any young engineering friend of the builder would no doubt have patronisingly predicted to him the fall of his work, for does not the line of thrust cut many yards outside the base of the angle piers where the two 14in. arches meet at right angles; and is not the including of the line of thrust within the "middle third" of the thickness one of the necessary elements of stability? Many cases of this class are to be met with in small country towns, where the town hall is carried upon arches and piers of the preceding description in order to afford space for a market underneath. These buildings do not tumble down, and as country builders reproduce the type continually, it is by no lucky chance that they escape. The country builder is wiser than his critics; he does not aim at making an *arch* except in appearance, for he has no abutments, but he takes special care to put his work together in such a manner as to ensure his getting a serviceable and perfectly reliable brick *beam*. There is another class of cases illustrative of the extent to which ordinary builders successfully avail themselves of the transverse strength of good brickwork, which may be suitably referred to here. As an example there may be taken the not infrequent case of a corner shop where the solid flank wall of the house is carried upon a rolled joist to admit of the shop front underneath being advanced beyond the general line of the building. It is easy enough to show that in many instances the weight of the wall and other load over the joists is in excess of its breaking weight, but yet no signs of weakness or distress are evidenced by the ironwork, nor is there even any appreciable deflection of the joists, so why make it stronger, the builder may reasonably ask. Although the brick wall itself constitutes a brick beam to a great extent, if not entirely, self-supporting, certain precautions are necessary to be taken during the progress of the work. Thus, in a recent case which came under our notice, the iron joists deflected to an undue extent, when some 10ft. in height of the wall upon it had been run up, upon which the builder propped up the joist until, and for some time after, the completion of the wall to its full height of 35ft., and subsequently removed the struts without inducing any appreciable increase in the sag of the joist. In short, a certain amount of time must be allowed, proportional to the stress to be sustained by the brickwork, in order to admit of the latter developing the necessary powers to resist transverse strain, or, in other words, to act as a beam.

The term "brick beam," though it may sound unfamiliar to many ears, is of no modern invention. A generation of engineers have almost passed away since the celebrated "Nine Elms" brick beam was tested and discussed by the engineers of the year 1837. This beam was in cross section in the form of an inverted ⊥, 4ft. 9in. deep by 2ft. wide for the lower six courses of bricks, and by 1ft. 7in. wide for the remainder of the depth. At a span of 21ft. 4in. the breaking weight at the centre proved to be 22 tons 12 cwt., or including one-half of the weight of the beam, the bending stress taking effect, the centre was no less than 27 tons. It is necessary to note that several courses of hoop iron bond were worked into the lower courses of this beam, since Brunel attributed its high resistance to this cause, although the experimenters, Messrs. Francis & Hemans, judging from the nature of the fracture, were of opinion that the hoop iron had contributed little or nothing to the strength of the beam. Subsequent experiments have shown that the truth was to be found between these extremes, and that the hoop iron contributed just so much, and no more, additional strength as theory would indicate. In the case of the Nine Elms beam, this would be a comparatively small amount, since the hoop iron was of no great section, and the relative elasticities of the materials are such that in no case could a large unit strain be imposed upon the iron in a compound beam of brickwork and iron until after the fracture of the brickwork had occurred.

Little progress appears to have been made in the investigation of the strength of brick beams for a period of fourteen years subsequent to the date of the preceding experiment, in fact, until Messrs. Bazley's beam was tested at the Exhibition of 1851. The beam in this instance was of much the same size as that tested at Nine Elms, the depth being 4ft. 6in., and the width at bottom and top 2ft. 3in. and 1ft. 6in. respectively; the bricks, however, were constructed hollow, with a thickness of nine-tenths of an inch of clay. The breaking weight at the centre of the span of 21ft. 4in., including one-half the weight of the beam, was about 32 tons. This shows an increase of 5 tons as compared with its original model, the Nine Elms beam, or about the amount which might have been anticipated from the improvement in the quality of cement effected in the interval between the two experiments. In this instance, as in the previous one, hoop iron bond was introduced, hence, before these experiments can be used as data for ascertaining the transverse strength of brickwork, it will be necessary to collate them with others where no such bond was employed.

In order to reduce the several experiments to one standard for comparison, it will be convenient in all instances to ascertain the value of the unit tensile strain in pounds per square inch, $f = \frac{M}{m}$; M being the moment of the stress, which for a weight at the centre of the beam will be $= \frac{W\,S}{4}$; and m the moment of resistance of the cross section, which for a rectangular form of cross section will be $= \frac{d^2\,b}{6}$

Hence, if the weight, W, be taken in pounds, and the dimensions of the beam in feet, the value of the maximum unit tensile strain upon the brick beam will be—

$$f = \frac{W\,S}{96\,d^2\,b}.$$

Applying this formula in the case of the two preceding experiments, the tensile resistance per square inch of the brickwork and hoop iron will be as follows:—

Nine Elms beam ... $f = 290$lb. per square inch
Exhibition beam ... $f = 350$lb. per square inch

It will be necessary now to compare these values of f with those derived from experiments on brick beams in which no hoop-iron bond was introduced, and also with the direct tensile resistance of cement and brickwork, as deduced from independent sets of experiments. By these means adequate data will be obtained to enable the probable strength of any brick beam to be predicted with a sufficient degree of accuracy to meet the engineer's or builder's requirements. The ordinary mode of experimenting upon the transverse strength of cement or mortar and brickwork is to carry out from a brick wall a cantilever of single bricks cemented together, and either to continue adding bricks to the end until fracture is effected by the weight of the cantilever itself, or to carry it out for a fixed distance, and then break the cantilever by the application of a load at the end. The depth of the beam in these instances may be taken as 8½in., the breadth 4½in., and if n be the number of bricks cemented together, the length of the cantilever may be taken as 3 n. Hence, if w be the weight in pounds suspended at the end of the cantilever, and 7½lb. be the weight of a single brick, the resulting unit strain from the weight at the end, and from the weight of the cantilever itself, will be—

$$f = \frac{15\,n^2 + 4\,n\,w}{72}.$$

Applying this formula, in the first instance, to a type example of General Pasley's experiments, which were carried out long previous to the construction of the Nine Elms beam, the case may be taken where the number of bricks cemented to the wall amounted to 31 in all, one brick having been added on each successive day until fracture occurred. Hence in this instance the value of f will be:

$$f = \frac{15 \times 31 \times 31}{72} = 200\text{lb. per square inch.}$$

Selecting, now, for comparison with the Nine Elms beam, some experiments of about the same date carried out by Messrs. Aspden and Robins, the value of f, for the type examples cited below, would be as follows:—

bricks.	lb.	lb.
1. 38 cemented together, broke with	14 at end,	$f = 330$
2. 30 ,, ,, ,,	15 ,,	$f = 210$
3. 22 ,, ,, ,,	168 ,,	$f = 310$
4. 25 ,, ,, ,,	56 ,,	$f = 210$
5. 26 ,, ,, ,,	71 ,,	$f = 247$

In the same series of experiments, 16 bricks, cemented together, broke with a weight of 15cwt. applied at the centre of 2ft. 6in. bearings; hence in this instance $f = 231$lb. In all the preceding cases Portland cement, with varying proportions of sand, was employed, but where Roman cement of an inferior quality was substituted, the value of f sank as low as 30lb.

Selecting in the same way for comparison with the "Exhibition" beam some experiments of the same year, by Messrs. White, the value of f for one type case, where 16 bricks were cemented together and tested with a weight of 370lb. applied at end, was 380lb.; and for another type case, where 20 bricks cemented together broke with a weight of 1,300lb. applied at the centre of 3ft. 6½in. bearing, the value of f was 255lb.

Many other experiments might be adduced, but as they would merely afford confirmatory evidence to the preceding, they may be dispensed with. It may be mentioned, in justification of this conclusion, that the value of f, as deduced by Wiesbach upon an entirely different basis to the preceding, varies from 180lb. to 340lb. per square inch.

(To be continued.)

Building Intelligence.

CHURCHES AND CHAPELS.

Bodmin, Cornwall.—At last there appears some hope that the long contemplated restoration of this fine old church will be commenced. Plans have been prepared by Mr. Withers, of London, and a faculty is now being obtained. The estimated expenditure is about £6,000.

Derby.—The new church of S. Ann, Derby, has been completed by Mr. Bridgart, from the designs of Mr. F. W. Hunt, of London. It is built entirely of red bricks, those for the interior and for the windows and doorways being Spondon best pressed bricks. Stone is introduced only for the pillars of the arcades, and for the tracery of clerestory windows. From the necessities of the site there are no windows on the north and east sides, and the lighting of the church is accordingly provided for by a lofty clerestory.

Kenilworth.—On Tuesday, the 6th inst., the foundation stone of the new Independent Chapel at Abbey Hill, Kenilworth, was laid by Alfred Keep, Esq., Edgbaston, Birmingham. The chapel is to be built of brick, with Bath stone dressings, from the design of Messrs. G. & J. Steane, architects, Coventry, in the Gothic style. The length is about 70ft., and width 31ft. 6in. The cost will be about £1,600, and is to hold 300 persons in the body, and 100 boys in the gallery. The builder is Mr. J. B. Stanley, of Leamington, and Mr. Jenkins, of Leamington, has the contract for fitting up with hot water.

Kirknewton, N.B.—The parish church here, which has been undergoing extensive repairs under the superintendence of Messrs. Brown & Wardrop, architects, Edinburgh, was reopened last Sunday. Previous to restoration, the church was of the usual Presbyterian type, erected about the middle of last century, cold and gloomy. The additions, which are considerable, are in the Gothic style. The interior has been fitted up in an elegant manner, and upwards of 180 sittings added. Messrs. Cook, Queensferry & Brodie, Edinburgh, were the contractors; Mr. Ford clerk of works.

Manchester.—The foundation stone of a new Congregational Church in Broughton Park was laid on the afternoon of Saturday, the 27th ult., by Mr. James Bancroft. The structure is designed in the Decorated Gothic style. It will consist of nave, aisles, and transepts; the north aisle has a tower at its termination, the spire being 175ft. in height. Accommodation is afforded for 600 persons in the church proper, and for 200 additional in a lecture hall at the east end of and communicating therewith. The estimated cost is £12,000. Mr. S. W. Daukes is the architect.

S. Michael's, Chester-square. — A new vicarage house is being built in Ebury-square, on a site given by the Marquis of Westminster, from the designs of Mr. Withers, architect, by Messrs. Adamsons, of Putney, at an expenditure of about £3,000. It is of red brick with Park Spring stone sparingly used, and will be covered with Penmoyle slate. Mr. Laidler is clerk of works.

Whitechurch, Pembrokeshire.—A dilapidated church existing here, it has lately been pulled down, and a new church is being erected on the same site by Mr. Hughes, of Newport, at a cost of £700, exclusive of stone and carriage given gratuitously. Mr. Withers is the architect employed.

Wigan.—The new (Roman) Catholic Church of S. Joseph, Wigan, is completed. Mr. E. Kirby, of Liverpool, is the architect, and Mr. Aspinall, of Wigan, the contractor. The building consists of a wide nave and a north aisle, wooden arches and columns separating the nave and aisle; a space is railed off at the end of the nave for the sanctuary. The church will accommodate about 900 people, and the entire cost will be about £1,500.

BUILDINGS.

Auchterarder (Scotland).—A town hall and fountain are being erected here by the inhabitants, in memory of the late Captain Aytoun, whose services in bringing a pure and constant supply of water to this rapidly rising village are gratefully remembered by the subscribers. It is in the Venetian Gothic style, with a gable facing the street, and a clock tower rising at one of the corners. The inside fittings will be of pine, all cleaned for varnishing. When complete it will be capable of accommodating 500 persons, exclusive of gallery, which is fitted up over entrance door on gable to street, which will seat (comfortably) 50 persons. The building is being erected from the drawings of Mr. C. S. Robertson, architect, Perth, whose design was selected in competition, at a cost (inclusive of font) of £2,000.

Summertown.—The new schools of S. Edward are being erected from the designs of Mr. W. Wilkinson, of Oxford. The building will be of brick, with Bath stone dressings. The principal front will face towards Oxford, and will be about 200ft. long. The master's house and class-rooms will be on the south-west. It is proposed on this side to build a cloister and chapel. The large school-room and refectory will be 60ft. by 24ft. A main stone staircase will lead to the dormitories on the second and third floors, where accommodation will be provided for 100 boys, the number on each floor being equally divided. There are in addition designs for private bath-rooms and one larger one for the use of the smaller boys. The cost of the present contract is £8,659. Messrs. T. Orchard Bros., of Banbury, are the builders.

LEGAL INTELLIGENCE.

In Re Edward Vigers.—Mr. R. Griffiths, on Saturday, in the Court of Bankruptcy, said he was instructed to ask for an interim injunction, staying further proceedings under a debtor's summons taken out by Messrs. Thompson & Smith, builders, of Paddington. The circumstances under which he made the application were of an exceptional nature. The debtor, who was described as of Harrow-road and Upper Westbourne-park, builder, brickmaker, and dealer in land, had failed for £90,000, and his assets, estimated at about £60,000, included an interest in certain valuable building agreements, his title under which was liable to be destroyed if he committed an act of bankruptcy.—Mr. Bagley, on behalf of Messrs. Thompson & Smith, offered no objection to an adjournment of the present motion, which would answer the same purpose as an injunction, until after the meeting of creditors.—The Registrar observed that an act of bankruptcy had already been committed.—Mr. Griffiths submitted that in the event of the creditors passing resolutions to liquidate by arrangement or for the acceptance of a composition, the act of bankruptcy would be purged.—His Honour, by consent, adjourned the motion until the 12th inst., to admit of the registration of resolutions which might be passed at the meeting of creditors to be held under the liquidation.

STATUES, MEMORIALS, &c.

The Proposed Equestrian Statue of the Prince Consort at Holborn Circus.—At the last meeting of the Court of Common Council it was resolved: "That so much of the resolution of this Court of the 2nd inst., upon the report of the Improvement Committee with design for the pedestal of the statue of the late Prince Consort, 'as instructs the Committee to advertise for designs of such pedestals, and awards a premium of fifty guineas to the author of the selected design, the same to become the property of the Corporation,' be rescinded."

The Scott Statue for New York.—Mr. John Steell, R.S.A., of Edinburgh, has been engaged upon a bronze replica of his statue of Sir Walter Scott, intended to be placed in the Central Park, New York. The first casting—that, namely, of the staghound which lies at the feet of the sitting figure has been some time completed. Three other heavy castings have since been made, and the work is now ready for shipment. By the application of a certain composition the bronze surface has been brought to a rich brown colour, with just so much of metallic lustre as serves to enhance the general effect. Judging by the result of experiments which Mr. Steell has been making, the surface thus produced is capable of resisting the corroding action of the weather, so that the statue may be expected to preserve, at least for some considerable time, its present appearance.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Correspondence.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT SOUTHAMPTON.

Sir,—The district of which Southampton may be said to form the centre is rich in historic association and archæological interest. Winchester alone, as at one time the metropolis of England, and as an important centre of Roman roads and a Roman encampment, is sufficient to give the county of Hampshire a prestige in archæological repute, though somehow or another it has seldom being honoured by the visits of archæological societies. Last week, however, under the presidency of the Bishop of Winchester, the ancient Borough of Southampton was made the scene of such a visit. Whether its influence will be felt among the people of Southampton, or whether it will be regarded as simply an innocent pastime or excursion of a few rusty antiquarians, it will be difficult to say. As the study of archæology is promoted either in the right or in the wrong direction, must either one or the other of these impressions prevail. As a conservative element, or as encouraging the preservation of antiquities, or as a valuable index of past ages of great help to the historian, archæological research cannot be over-estimated. Properly studied as a science, the philosopher may find help in it as indicating the evolution of the human mind. But it may be studied wrongly, and is generally so with enthusiasts. They fancy the study of antiquity transcends all other human knowledge; that the past should shape all modern ideas, and that all modern thought and art should be measured and estimated by it. Piecemeal antiquarians are generally more narrow-minded than those who have travelled and studied largely. Archæology, however, has done noble work in cultivating a love for, and kindling an enthusiasm in, Mediæval art, and in checking the sordid mercenary utilitarianism of the present day. It has thus been a useful reactive.

The perambulation of the town formed the first day's proceeding. The fine ancient Bargate, with its half-concealed flanking towers and machicolated parapet, and the connecting walls of the town, were examined and commented upon by Mr. Parker, the Rev. E. Kell, of Southampton, and others. The north front of the gate, Mr. Parker said, was of two periods, one of Henry III. and the other of Edward III. A round Norman arch under the centre archway is clearly of early date, probably about 1100 A.D. This probably escaped Mr. Parker's notice. The party then traced the line of walls on the north and west sides of the town. Mr. Parker thought they were partly built against Norman work, the parapet wall being of the thirteenth or fourteenth century. The bastions and round tower, one of the corner fortresses, the site of the Castle, and other remnants of the old fortifications, some of Norman and others of Edwardian date, excited curiosity, as also did a vault in Simnel-street, reputed to be a crypt, but which, Mr. Parker said, was evidently a fine merchants' vault of Edward III.'s time, and probably the King's store, as Southampton did a large trade in wine at that period. Some portions of the west wall elicited attention, Mr. Parker observing he knew no other wall like it—the machicolations being so long as to allow a beam of wood to be lowered to resist the battering ram of assailants. Remains of window lights, fireplaces, doorways with shafts, capitals and bases in good preservation, give a relish to these walls for the architect also. The west gate, with its double portcullis, corbels, &c., showed it to have been a gatehouse. Reaching God's House, Mr. Parker observed on the ruthless destruction of "restorers," and that restoration was really "devil's work" to antiquarians: there had been a merchants' house here of twelfth century work—a fine example until the last few years. The church also, lately restored, came under the archæologists' lash; little of the original work had been left, save inside, where twelfth century walls existed, the exterior having been re-cased. This church possesses interest from the fact of being the site of the execution and burial of conspirators against Henry V. on his sailing from this port for Agincourt. Thirty years ago a perfect Norman house existed—a rare work.

S. Michael's Church was the next object of interest, originally a Norman cruciform church with central tower, the arches of which still remain, and carry the present spire of modern date. Various additions were made to it, as seen by the windows and insertions. The present outer walls are of fifteenth century and later work. Mr. Parker made an *apropos* remark as to the inside rough surface of the walls which have been lately stripped of the plastering. He judiciously said that the builders of churches never intended the inside walls to be left without plaster or paint, but that when once peeled off it would be an advantage to archæologists to leave them so as to show the additions and alterations. The writer does not think, with all deference to archæology, that churches still doing duty in that capacity should be left rough interiorly, as in this case. It is stretching archæological veneration too far. The font claims special notice. It is one of three remarkable examples of Early Norman workmanship, the other two being Winchester Cathedral font, and East Meon Church font. Mr. Parker ascribes its rude sculptures to the twelfth century; the writer thinks an earlier date, or about the latter end of the eleventh more probable. Mr. Britton places the font at Winchester, which is almost identical in design to this, to 1097 A.D. It has a square top, supported on one central and four angle shafts, and is of a black hard stone, like marble. There is no clerestory to this church, and the roof, which is of a flat pitch, covers the whole width, embracing nave and side aisles, a rather uncommon arrangement, though one certainly suggestive to the architect. It is of modern design.

A visit to the site of the ancient town Clausentum (the Roman Castellum), on the banks of the Itchen, near the residence of Mr. Stewart Macnaghten, concluded the first day's perambulation.—I am, &c.,

G. H. G.

SCHOOL PLANNING COMPETITION.

Sir,—I should not again have troubled you on this subject but for the statement which "T. P." makes that I have propounded some "new theory." Lighting from the top, however, is no new theory, as the least experienced ought to know. If "T. P." will only use his eyes at the nearest railway-station, picture gallery, or billiard-room, he will see at once that top-light is no new theory, but on the other hand it is a satisfactory arrangement, in some cases preferable to all others, while often the side walls are left a dead blank. "T. P." says they are gloomy and unfitted for their purpose; but I question if architects with power almost divine could arrange a building with side lights better adapted to their purpose. Doubtless, even "T. P." would have misgivings on the subject, for he admits that "lighting from the top is best for the few moments devoted to the study of drawing." Quite so, but why? In the answer to that question the essence of the matter lies. It is best because it is natural and more diffused and complete; and what is best for drawing is also best for writing, or reading, or cyphering. A conservative prejudice exists for customs hitherto adopted, which, however, are frequently more honoured in the breach than in the observance, in school planning as well as politics, so, therefore, in discussing this matter we are met with simple declamation, without argument, and an evident desire to stifle expression of opinion by agencies bordering on the ludicrous. Compare the fatal admission of "T. P." that top-light is best for some occupations in schools, to the nlightened conclusion at which he has arrived, and we have an example of the flippant study which architects generally give to this and other works:—"I shall still light schools with windows at the back of children." Where is the consistency with this and his other statement? and where is the desire to arrive at the truth? and where is the attempt to enlighten the readers of the Building News? Echo answers, where?—I am, &c., H.

PROTECTION TO ARCHITECTS.

Sir,—Your comments on the letter of "Justice" (p. 91) leave room for little further to be said on the subject of which he complains. Of course, "Justice" is not a "professional architect;" they are not in the habit of complaining when unauthorised "persons" intrude on their domains. It is, therefore, not unfair to presume that he belongs to the class of tradesmen he so affects to despise, though, apparently, not of the happy few who obtain "plenty of business." Had "Justice" ventured on using his own name, his communication might have been entitled to some respect, but as he has thought proper to shelter behind a designation which, to say the least of it, does not fit, I would only say, for his particular information, that it would not be difficult to name gentlemen who study and practice architecture with a true love of the art, and who do so successfully, in every sense of the word, who have not had the benefit of the particular training he seems to consider essential to enable any one honestly to style himself Architect.—I am, &c.,

John F. Shepherdson.

Driffield, August 5, 1872.

[Mr. Shepherdson is mistaken. The writer of the letter signed "Justice" is a professional architect, or we should not have offered the comments we did on the letter.—Ed.]

PLYMOUTH ARCHITECTURE.

Sir,—Your correspondent, "H.," appears to have taken a very cursory view of Plymouth, as he only notices two or three architectural subjects, and those chiefly in modern quarters of the town. He says nothing of the fine old house in North-street, the Abbey, Hoe Gateway, and the entrance to the Citadel. He passes over S. Andrew's Church, with the exception of the tower, and appears to be ignorant of the peculiar claims of Charles' Church, a curious post-Restoration building, which possesses far better Decorated windows and Perpendicular roof than would have been executed forty years ago. Whilst commenting on the Roman Catholic Cathedral which, with the exception of the tower, is below criticism, he might have noticed a more respectable building belonging to the same community a few feet westward; and had he gone a little further in that direction he would have fallen in with some work by Mr. Street, R.A., and been within a gunshot of the Anglican Sisterhood's Home, by Mr. Butterfield. Then, again, while surveying the Duke of Cornwall Hotel, he was within fifty yards, or less, of the unfinished but unique and elegant Church of S. James, the work of Mr. St. Aubyn, and almost, if not quite, in sight of the fountain tower near the Royal Hotel, which, although dwarfed by that and other surrounding buildings, is not without considerable merit. I wish I could remember the architect's name, but it has escaped my memory. Then there is a church (S. John's), by Mr. Ferrey, sen., which, however, is not worthy of his reputation, being more fitted for a small country than a large town parish; and a dissenting college by Mr. Hine, a local architect, might have been worth his notice. I could add many more specimens worthy of either praise or censure.

What he says of compo. is true only as regards the late Mr. Wightwick, or rather his predecessor, Mr. Foulston; but the school founded by the latter has pretty nearly died out. A recently-deceased local architect, whose name I forget, deserves much credit for having originated the crusade against compo., which is now rarely used in works of any size or pretension. It used to be a local article of faith that it was impossible to erect a waterproof building without external plaster, in consequence of the driving winds and rains; but church architecture having proved the contrary, civil architecture has followed suit.

As regards Charles' Church, it may be explained that new styles did not easily obtain a footing in the out-of-the-way parts of the country, where the old styles lingered on after they were exploded elsewhere. The parish church of Ottery S. Mary, the finest in Devon, would be set down by a jury of architects as Early English, whereas there are documents to prove it was built some eighty years subsequent to that period, and ought, therefore, to have been Flowery Decorated.—I am, &c.,

A Plymouthian.

Sir,—We were very pleased to see a letter in your last impression on Plymouth, and quite agree with the writer that if any place in the world has the plague of stucco it is Plymouth, and believe that if a little more attention were called to the architecture of this "metropolis of the west" it might be of great service towards its improvement.

True indeed is it that there is extremely little of architecture to be seen; but I must take exception to "H.'s" statement that there is nothing, although not perhaps quite a gem "like as it were a star," &c., and also beg to set "H." right with respect to some of his statements, and with your permission will make a few remarks on one or two architectural abominations lately erected. Under the name of "Plymouth" may be comprised the adjacent towns of Stonehouse, Devonport, Stoke, and Morice Town, and your correspondent's remarks seem to be confined to a very small portion of the place only.

With respect to the Guildhall, "H." remarks, "We think a mistake has been made in squeezing the municipal block on the very verge of the street." At the east side, had this not been so, the fine effect he so much admires looking from the "gin-shop" corner towards the south-east would not have been obtained. Moreover, this is the principal approach to the buildings from the heart of the town; the two blocks are not of equal length, and at the eastern end form the boundary of the roadway. We fail to perceive the force of "H.'s" remarks with reference to the circular tower at the north-east corner of the municipal block. It has no "square base" to "sit uncomfortably" upon, but rises from an octagonal foundation, broached into a circle at about the height of 10ft. from the ground, neither does it appear as if a piece had been cut out for it; with all due deference to "H.," we humbly think it will not be at all a poor feature in the building.

The tops of the two small towers at the west end, stigmatised by "H." as being pretentious, we cannot think are so fantastic as they are stated to be, and the diaper of Delabole and Bangor slates in the lower part and the bands in the upper form a pleasing variety of colour of low tone. The woodwork, perhaps, would have looked better simply varnished than as at present grained, but the brightness of colour will soon depart under the influence of the abundant supply of rain for which Plymouth is famous. The figures on the tops of the gables may be somewhat out of place; but the bases are far from out of proportion, and bear no earthly resemblance to a "cabbage-leaf."

Near the north-west corner of the Guildhall there is an ugly excrescence in red brick built in the roadway, four stories in height, obscuring its northern side from view. It is an object of wonder as to the reason of such an encroachment being permitted by the town authorities. At the back of this ugly brick erection (remarkable for arches of large span and no abutments), which is part of the premises occupied by Mr. Matthews, confectioner, is the principal front of the house in Bedford-street. This is a very pretentious design, in which polished granite and marble, red brick and freestone, have been used with very bad effect. It is a four storied building of a nondescript character, and Italian and Gothic details are mixed together in the most admired confusion. The sills of the second floor windows are moulded like an Italian cornice, supported on very slender polished marble columns with Gothic foliage in the caps; the shafts are carried by small corbels springing from the junctions of arches of first floor windows, the piers of which appear vastly too slender. The second floor windows are very ordinary, with the vernacular pilasters, trusses, and cornice; they look stuck up against the wall supported at each corner by the slender columns before mentioned. The windows above are too small and insignificant, and the main cornice of poor design. The chimneys, which are seen for a long distance above the roof of adjoining house, are merely of plain red brick, without the slightest attempt of any kind to relieve their naked deformity. A prodigious quantity of carving has been used, which is well executed, but is totally out of character with the building it is intended to adorn. We hope for the credit of Plymouth that no more work of this kind will be done, and would recommend its architect to stick to his plaster architecture rather than attempt more than he can perform.

On the western side of the Guildhall are two of the most hideous of all the ugly houses of Plymouth. These houses are an attempt at Gothic in plaster three stories in height. The ground floor is a shop in one case, and a private house in the other. The first floor is lighted by three windows, one over the shop about as broad as high, filled in with flat sash mullions painted dark green, with a horrible travestie of a hood with ball flowers over. The other two windows are altogether dissimilar to this; they are tall, and have circular heads with huge keystones dropping forward into the street, and look as if they would fall at every moment; the labels are in their case thick cables (in cement), no doubt thoughtfully provided to make fast the keystones, and are finished at the ends by immense curls. The upper windows are quite as ugly, with cables also; the cornice is a wondrous design, with very large trusses, supporting nothing at the ends.

Leaving this neighbourhood, let us proceed to correct a slight blunder of your correspondent's with reference to the newest block of houses on the Hoe—the "thick stucco tracery in the shape of a double arch with a cement foliated boss being suspended from the centre by, we suppose, a wrought-iron bolt." The whole of this work is of cast iron of about ¾in. thick, but, doubtless, "H." is quite right with respect to the effect of a double arch without support in the centre being very bad.

In Stonehouse, near the Marine Barracks, stands the "Admiralty Schools," a well-designed building of Gothic character, three stories in height, built of Portland and limestone, and has some really good detail; the doors have glazed panels, and fanlights protected from damage by some beautiful scroll work of iron. There is no frippery or pretentiousness of any kind. We do not know who designed this building; no one, we believe, in this neighbourhood, but we should be very pleased to see more of the work of the same architect in Plymouth.

In Edgcumbe-street, Stonehouse, is a good Gothic shop and house of red brick and Portland stone, occupied by Messrs. Blight, tailors, designed by Mr. H. J. Snell, who has also built three houses and shops in Old Town-street, Plymouth, of somewhat similar character of the same materials, which we consider of far better design.

Devonport contains nothing that might be called architecture, with the exception of a school-house in Cornwall-street two stories in height, which is very bold and effective (Gothic, Early Pointed). This certainly does gleam like the star so poetically referred to by "H.," as it is in a very squalid neighbourhood. There are some caricatures of Egyptian and Hindoo architecture in plaster by the late Mr. Foulston, and some very ordinary district churches by Mr. P. St. Aubyn. The large villas at Stoke are of very poor Italian architecture and worthless details.

At the entrance to Devonport Park, from a design by Mr. Alfred Norman (of the Guildhall, Plymouth), is a very beautiful Gothic lodge of brick with some good carved woodwork, and details. Maw's encaustic tiles have been used very successfully as a means of decoration.

Visible from the park and across the river is a large Tudor mansion in course of erection by the same architect, for Lord Graves. The building is of limestone and Portland dressings of good design, and fine and well considered details, and which will be, without doubt, the finest piece of architectural composition of its kind for many miles around.—I am, &c ,

Plymouth, August 7. Quatrefoil.

SCHOOL PLANNING COMPETITION.

Sir,—I candidly admit that my last letter justified and deserved your marks of disapproval, but I think you would hardly have been so severe if I had had time to give my explanation in the postscript.

By omitting the name of the schools referred to in a former letter I merely followed the example previously set by "H." in his letter published in your issue of the 12th ult., where he mentions "a school building he had recently designed" without giving the name. The schools to which reference was made in my letter are the "Luxulyan Parochial," near Bodmin, which accommodates about 200 children, but this reference is a matter of slight importance, when so many, it appears, are similarly lighted.

I fail to be convinced that "it is foreign to purpose to quote Mr. Robson," when his remarks on lighting were made with especial reference to a letter which he had observed in the Building News (vide your report of the meeting).

I will conclude by referring to a portion of the report of the architect of the Education Department on the Wherstead-street school, Ipswich:—

"The arrangement of the plans would render it necessary to light a large part of the school and class-rooms by means of roof-light. This mode of lighting is not quite satisfactory, as, by itself, it does not secure as good ventilation as is desirable. If the roof-light is obtained by skylight, this cannot well be opened in rough or wet weather, while oftentimes they admit too much sunlight and make the rooms too hot. If lantern-lights are adopted these objections can be obviated; but the cost of lantern-lights is considerable, while they are not effective for ventilation unless a considerable amount of air is admitted from below, which renders the room draughty."—I am, &c.,

August 6. S. Trevail.

SUNDERLAND SCHOOL BOARD COMPETITION

Sir,—You were kind enough to insert a letter of mine of the 31st relative to the above. I now beg to enclose you a reply I have this morning received from the Clerk to the Board. If the professional man named in the enclosed letter be an architect, I am sorry for his reputation's sake; if, on the other hand, he be a solicitor, it is only what one might expect.—I am, &c.,

Ridley King.

24, Park-square, Leeds, August 7.

[*Copy.*]

School Board of the District of Sunderland,
Board Room and Offices, 57 and 58, Fawcett-street,
Sunderland, August 6, 1872.

Dear Sir,—Your letter of the 31st ult. was laid before the School Board at their meeting to-day, and I was directed to say that the instructions to architects having been prepared by a professional man, the Board do not see their way to make any alteration therein.—Yours truly, John C. M. Keape, Clerk.

Ridley King, Esq., 24, Park-square, Leeds.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINAGE.

Sir,—Mr. Osbourne Reynolds's plan for dealing with the gas generated in drains, by means of outside cesspools or troughs, is a step in the right direction, and, curiously, a similar idea I proposed in your journal some time since under the heading of "Drainage, Liquid and Gaseous" (Vol. XXI., p. 472, December 22, 1871). My plan, however, would provide a small trough at *every* discharge or closet, and a syphon-trap as well to each, thus doing away with the objection of "Plumber" in your last issue. These troughs could easily be got at and the gas find ready exit at every junction before entering the house. I have published the details elsewhere.—I am, &c.,

G. H. Guillaume.

LABOURERS' COTTAGES.

Sir,—I trust "Wiltshire's" able letter will open the eyes of estate owners, &c., to the fallacy of thinking they can erect substantial brick-built cottages, with three bedrooms, living room, offices, &c., complete for £100 each.

In 1868 the "Hertford Labourers' Friend Society" awarded the £20 prize for the best design for the above to Mr. Scriven, of Leamington. Can any of your numerous readers inform me if any cottages have been built (and where) in accordance with that design, and for the sum specified in the conditions—viz., £200 per pair?—I am, &c.,

A Competitor.

◆

Intercommunication.

◆

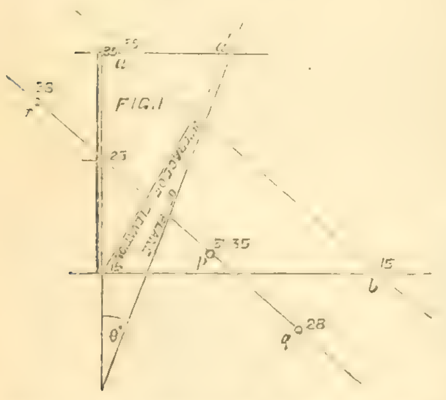
QUESTIONS.

[2619.]—**Lighting Interiors.**—Will any one inform me whether there is a rule by which the lighting of interiors should be regulated, having reference always to the cubical contents of the interior to be lighted; or, in other words, given the cubical contents of an interior, what superficial quantity of lighting surface will be required?—Druid.

[2620.]—**Slating Towers.**—The Plymouth new Guildhall has octagonal towers; the spires are boarded and slated; there is a roll on each hip which is covered with lead, and the lead goes under the slating about 2½in., which I think is wrong. To my idea it should be on top of the slating.—One of a Trade.

[2621.]—**Oblique Arches and Skew Bridges.**—Can you or any of your readers give me any information of a work which renders a full and detailed account of the construction of oblique arches or skew bridges, with particular reference to the angle of joint, with face of arch-stone, and method of obtaining the required twist on the soffit of each, and every arch-stone necessary to complete the kind of arch above named? Your immediate attention to my request will greatly oblige.—J. Carlton.

[2622.]—**Geometrical.**—In studying the "Elements of Geometry," by Professor Bradley, I have come to a dead lock with Fig. 7, Plate 10, which is as follows:—Let Z be the scale of the plane, and p, 31·35, the given point. Consider the light line of the scale of slope as representing the level 15in. elevation, setting off from that line 20 units to a', while the elevation of the fifteenth horizontal will be in the line of level; from a' draw a line $a'\,b$ to meet the ground line at an angle equal to θ; set off the length of the base of this right-angled triangle anywhere from a to b, between the horizontals 15 and 35 of the plane. The index of a being 35, and that of b 15, this line is made to lie in the plane Z, then a line through p, parallel to $a\,b$, will be the line required parallel to the given plane, and inclined at θ (the sketch is one-third the size of figure). Perhaps some of your readers will show me why the line passing through p 31·35, having the same inclination as $a\,b$, and parallel to the plane Z, can have the points p and q, at 38 and 28, and they would greatly oblige—A Leeds Joiner.

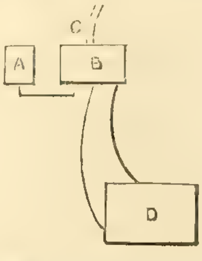


[2623.]—**Stencil Plates.**—Will any one kindly inform me through "Intercommunication" what is the best material for stencil plates, and how it should be used?—Druid.

[2624.]—**Laboratory Requirements.**—Will any reader oblige with the requirements as per the "Science Directory" of September, 1871, p. 149; also with an epitome of the Public Libraries Act (18 and 19 Victoria, cap. 70)?—F.

[2625.]—**Asphalte.**—If asphalte is specified to be laid in an external situation is not the term usually construed as comprehending the customary quantity of spar, or limestone, without its particularisation?—Query.

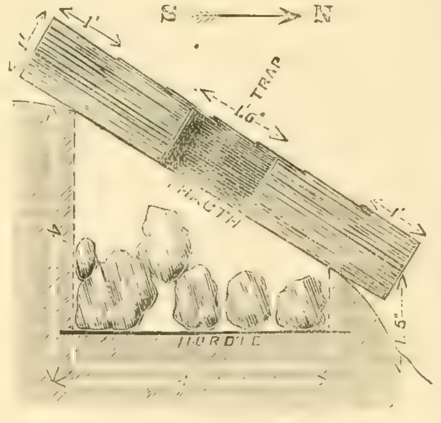
[2626.]—**Kitchen Boilers.**—Can any one tell me the cause of the following noise: D is the kitchen boiler. B is a hot-water hermetically-sealed tank, connected with the boiler by two pipes, so that when the boiler gets heated at first—the water in B being cold—the cold water in B is displaced by the hot water rising from D, and thus a constant circulation is kept up. D is a smaller tank which supplies B with cold water. C is the steam outlet pipe. Every evening about 7 o'clock a loud rumbling noise, audible throughout the house, commences, and is very unpleasant. Not knowing what causes it, we always draw off water from the kitchen boiler D till it ceases. Is there any danger?—J. T. J.



REPLIES.

[2609.]—**Plaster.**—Mr. Gilbert R. Redgrave says that if the lime used is hydraulic, the plaster or stucco made with sea-sand is benefitted rather than otherwise by the salt in the sand. If I were to repair a large patch of plaster in a room with plaster made of blue lias and sea-sand, would not the patch show through the papering in wet weather? I can understand that the hydraulic stucco or plaster may be the harder from its being damp. Is this so?—R. F.

[2610.]—**Ice-House.**—The enclosed section is, I believe, as good and efficient an ice-house as it is possible to have, and particularly adapted for the country. In a bank, facing the north, cut a trench of the dimensions shown in sketch, sunk 18in. below the ground. Six inches above the bottom of this excavated trench fix a wattled hurdle, to allow the ice melted to drip through. On this hurdle place the ice in as large blocks as possible. The roof of the trench must be covered with a good thatching of from 1ft. to 18in. thick, with a hinged trap about 18in. square to allow the ice to be got out. The roof should overlap the vertical walls of the trench at least 1ft. The length of the trench will, of course, be regulated by the amount of ice required.—J.T.J., R E.



[2617.]—**Varnishing Chimney-Pieces.**—I fear "J. B." will have a job to get a varnish for his purpose. I believe the only way will be for him to work it up with putty-powder in the same manner as stone and monumental masons.—J. T. J.

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The village hospital at Ditchingham, Norfolk, is now being roofed in, it will provide about twenty beds for patients, besides all the necessary accommodation for sisters, nurses, and domestic arrangements. Mr. Botwright, of Bungay, is the builder, who also supplies all the bricks and tiles from his brickfield. The cost will be about £3,000. The architect is Mr. R. J. Withers, of London.

PARLIAMENTARY NOTES.

The Lambeth Potteries.—On Thursday week, in answer to the Archbishop of Canterbury, the Earl of Morley said that two distinct departments were concerned in the complaints which the most reverend prelate had made respecting the Lambeth Potteries. The Home Secretary had power under the Smoke Acts; but the powers which had been given to him by the Local Government and the Sanitary Acts were last year transferred to the Local Government Board. The Home Secretary had given special directions that a strict watch should be kept on the potteries, and all necessary measures would be taken to enforce the provisions of the Smoke Acts. The most serious complaint, however, had reference to the alleged emission of muriatic acid gas in dangerous quantities; and the Local Government Board have referred the matter to the Vestry, which at the present time had the report of the medical officers under their consideration, and it had not yet sent any answer to the Board. The central body could not interfere, except in case of negligence on the part of the local authority. As to the injury said to be done to property, it rested with those aggrieved to resort to the courts of law.

Department of Science and Art.—On Saturday, on the vote of £224,812, for the Department of Science and Art, Mr. Sclater-Booth inquired of the Government what steps had been taken with reference to the recent defalcations at South Kensington Museum; whether Mr. Simpkins, the defaulter, had any available assets, whether the vacancy had been filled up, and what measures had been taken to avoid a recurrence of such irregularities.—Mr. Baxter said that the Government were still inquiring into the matter, and it would probably be necessary to adopt some uniform practice to check the proceedings of persons who had to account for public money.—Mr. W. E. Forster said that the total defalcation was £7,740, of which £1,346 had been recovered. The pension was, of course, forfeited, and the vacancy had not been filled up. In future no money would remain in the office, all extra receipts being at once paid into the Bank of England. He did not consider that Mr. Cole was to blame at all. The defalcation had been rendered possible by defective audit, and the system of transferring large balances from one office to another, which would be altered. In reply to further questions he said that the Government were considering the question of the removal of the Naval College; and that the Bethnal-green Museum had cost £4,500. The number of visitors last week was 57,000 as against 17,000 at South Kensington.—The vote was agreed to.

British Museum.—On the vote of £89,201 for the British Museum, Mr. Walpole said that there was apparently a diminution of the estimates this year to the extent of £20,000, but that this diminution represented the amount of money granted last year for the purchase of the Castellani collection. He wished to take this opportunity of referring to the excavations at Ephesus. It was nearly eight years ago since these excavations had commenced, and the expenses were comparatively moderate at first, but had of late been increased by the more extended operations which had been undertaken on the discovery of the site of the Temple of Diana and other interesting subjects. At the end of last financial year the trustees were informed that the firman of the Porte, under which these excavations were carried on, was not likely to be renewed. The works had been discontinued, and it became the duty of the trustees to consider whether they should apply any portion of their own funds, or apply to the Treasury for the means of prosecuting the work. He was glad to say that the application had met with a favourable reception from the Chancellor of the Exchequer. The excavation had been completely successful in some of its objects, namely, ascertaining the exact site of the Temple, and also in the discovery of some interesting inscriptions and architectural and sculptural remains. There was a supplementary estimate for two other purposes connected with the British Museum—for the purchase of certain Papyri, and for some additions to the Wigan collection of Roman coins, which, when completed, there would be no collection in the world to equal it.—The following votes were agreed to:—£5,815, National Gallery; £2,000, National Portrait Gallery (after a suggestion from Sir C. O'Loghlen to form one in Ireland).

The Law Courts.—On the vote of £37,300 for the new courts of justice and offices, Mr. C. Bentinck moved to reduce the vote by £5,000. He observed that although the whole amount asked for was no less than £1,500,000, they had never had the plan of the buildings presented to them in an intelligible form. They had, moreover, been kept in total ignorance as to who had the control of the designs, and he thought the Chancellor of the Exchequer should give some explanation on that point.—Mr. W. H. Smith remarked that there had been a very great loss of interest in consequence of the delay.—Mr. Ayrton said his hon. friend had assumed that Mr. Street was an incompetent architect; whereas there was no ground for such an assumption. The design had varied from time to time in ornamentation, but substantially there was no deviation from the original design exhibited in the library. Then what constituted picturesque beauty or effect was so much a matter of opinion that it was not worth while to discuss them. Finding that there was a multitude of details, Mr. Street thought it desirable that the agents of the contractors should follow him as he proceeded, and that course had been pursued. The contract drawings required a good deal of time for their preparation, and he feared that they would not be ready to receive tenders for three or four months. The foundations were sufficiently advanced to enable the contractor to carry on his work for three or four years. At present nothing was going to be done with the vacant land around the site of the courts; nor was that desirable, considering the large space required for the preparation of stone and other materials. If any hon. member thought the southern elevation not a proper one, let him take the sense of the House on that point. Mr. Street was perfectly competent to revise his own design.—Lord J. Manners reminded the hon. member (Mr. C. Bentinck) that the responsibility of the works rested by Act of Parliament on the First Commissioner of Works. His hon. friend could not desire to send Mr. Street to the right-about. The sooner they got on with that great work entrusted to one of the first architects of the day, the better would it be for the architect, that House, and the country.—In reply to Mr. Alderman Lawrence, Mr. Ayrton said the architect had entered into a contract to complete his duties for a certain sum. In reply to Sir C. O'Loghlen, Mr. Ayrton said he believed the time required for the completion of the building was six or seven years.—Mr. C. Bentinck then withdrew the amendment, and the vote was agreed to.

Metropolitan Buildings Act Amendment Bill.—Dr. Brewer, on Tuesday, upon the order for the second reading of this bill, said that it was useless to attempt to pass the measure this session, and therefore he should move that the order be discharged, but early next session he should again bring it in.—The order was discharged.

Local Sanitary Authorities.—Mr. F. S. Powell gave notice that on the earliest day of next session he should ask leave to introduce a bill, in pursuance of the recommendations of the Royal Sanitary Commission, for amendments of the law in relation to the powers and duties of local sanitary authorities.

Metropolitan Water Supply.—Mr. Kay-Shuttleworth asked the President of the Board of Trade what progress had been made in the inquiry instituted by the Board of Trade (under section 22 of the Metropolis Water Act, 1871) in relation to the regulations proposed by the London water companies; and how soon that inquiry might be expected to terminate.—Mr. C. Fortescue was able to give a satisfactory account of the progress made by the inquiry. The committee appointed by the Board of Trade to hold the inquiry had sat several days and heard counsel in support of the regulations proposed by the water companies, and also counsel in support of the objections of the Board of Works and the Corporation of London. The 35 regulations had been considered separately, and they had all been settled except two. The committee had adjourned until Thursday to give the parties an opportunity of coming to an understanding, and there was reason to hope that the inquiry would be closed on Thursday. As soon as possible after the presentation of the report the regulations would be sanctioned.

Public Health.—On the motion for the third reading of this bill in the House of Lords on Wednesday, Lord Buckhurst and Lord Redesdale warmly protested against the impropriety of bringing a measure of such importance before their lordships at a time when it was impossible for them to bestow upon it the consideration which it deserved.—The Marquis of Ripon reminded the noble lord that at this moment the Commons were considering a bill of equal importance which their lordships had sent down to them—The Licensing Bill.—Lord Redesdale—But when did we send it down to them? They had it several weeks ago, whereas this bill only came up to us three days ago.—The bill was read a third time and passed.

WATER SUPPLY AND SANITARY MATTERS.

Tewkesbury.—The Tewkesbury Board of Health have adopted a resolution to the effect that they will forego further proceedings in Chancery against the city of Worcester for the space of fifteen months, so as to afford time for Parliamentary action in regard to the disposal of town sewage, and to enable the Worcester authorities to adopt a plan of preventing the pollution of the Severn by the discharge of sewage into it.

The Bermondsey Water Supply.—At the last meeting of the Bermondsey Vestry, some correspondence between the Board of Trade and the Vestry, relative to the water supply of the parish, was read. The first letter, dated July 23, was from the Board of Trade, and stated that a memorial had been received from a certain number of the inhabitants complaining of the deficiency of the supply since the date of Major Bolton's report. The Board therefore requested the Vestry to furnish the particulars of such complaints since the 16th June, with a view to their being examined and reported upon. They also requested that reports of the medical officers of Bermondsey and Rotherhithe as to the health of their respective districts should likewise be sent. The Vestry, it appeared, had complied with this request, and a second letter was subsequently received stating that the Board of Trade had inquired into the various complaints, and had given formal notice to the Southwark and Vauxhall Water Company that the complaints were well founded. There was every reason, however, to believe that the evil complained of was very much aggravated, and in some instances produced, by the disgraceful state of the fittings in many of the smaller houses. With regard to the health of the parish, the Board expressed its satisfaction that, according to the medical officer's report, it did not appear to have suffered.

STAINED GLASS.

Hawkhurst.—A window is to be erected in the parish church of Hawkhurst, to the memory of Sir John Herschel. The subject is to be, "The Magi following the Star," and the cost £160. Messrs. Clayton & Bell are the artists.

Minster.—Two painted memorial windows have recently been placed in the west-tower-end of the old church of S. Mary at Minster. In 1863 this church was restored at considerable expense. The windows have been executed from the design and under the superintendence of Mr. J. P. Seddon, by Mr. J. R. Thompson, of Southwark. They represent the figures of the Virgin Mary, with the infant Saviour and S. Joseph, richly draped, standing under conventional canopy work, bearing the initial letters R.I.P. as a monogram in each case. The background of one of the windows is a ruby and of the other a deep green, and the prevailing colours in the border are respectively counterchanged. Blue is used behind the canopies to throw them into relief, and is carried round each light between the border and the subject.

CHIPS.

In the list of the competitors for the Asylum at Virginia Water, the names of the authors of that marked "Mens sana in corpore sano" should have been "Messrs. Mathews & Quilter," instead of Mr. J. S. Quilter.

The memorial stone of new schools and literary institution was laid at Westbury, Wilts, on Wednesday week. The architect is Mr. Stent, Warminster.

Silian Church, Cardiganshire, is to be altered and enlarged under the direction of Mr. Withers, architect, at an estimated expense of £700. Mr. Morgan is the builder.

The Commissioner of Public Works, Washington, U.S., has given an order to the Massachusetts Granite Company to quarry and cut a stone 26ft. 8in. long, 17ft. wide, and 2ft. 10in. thick, for the base of a statue in that city. It will weigh over 100 tons, and will be the largest ever cut in America.

At the meeting of the Metropolitan Board on Friday last a letter was read from Mr. W. H. Smith, M.P., offering 20 wooden seats to the Board, to be placed along the Victoria Embankment for the use of the public. He was willing to leave the choice of the seats to the engineer of the Board, but wished them placed there as soon as possible.

Christ Church, Barnton, was reopened on Tuesday week after restoration and re-decoration by Messrs. W. & G. Cross, of Northwich.

The parish church of Kirknewton, N.B., was reopened on Sunday last after restoration. Messrs. Brown & Wardrop were the architects.

A new chancel recently added to S. Peter's Church, Carrington, was consecrated on the 23rd ult. Mr. W. H. Wheeler, of Boston, was the architect. The body of the church has also undergone considerable improvement.

The corner stone of a new transept about to be added to the parish church of Harbury was laid on Tuesday week. The church dates from the thirteenth century, and the style of that period is to be adhered to. Mr. C. Buckeridge, of London, is the architect.

At the last meeting of the Paisley Parochial Board it was resolved to proceed with the erection of a New Parochial Asylum. The committee appointed was instructed to consider as to a site and report.

Mr. Stevenson, sculptor, Castle-terrace, Edinburgh, has been commissioned by the Corporation of Newcastle to execute four statues for the new Law Courts there. The statues will represent Justice, Truth, Mercy, and Peace.

A movement has been started for the purpose of presenting a testimonial to Mr. George Smith, of Coalville, near Leicester, who has laboured to ameliorate the condition of the women and children employed in brickfields.

The Haymarket Theatre is being entirely redecorated by Messrs. Harland & Fisher, of Southampton-street, Strand, under the direction of Mr. G. Somers Clarke. The same firm decorated Windsor Theatre some time back, also under Mr. Clarke's direction.

Our Office Table.

London and County Banking Company.—At the half-year meeting of the directors of this bank, held on the 1st inst., a dividend of 6 per cent., together with a bonus of 4 per cent., was declared for the half-year ending June 30, 1872. An issue of 10,000 shares on the capital of the company is offered rateably amongst the present proprietors at a premium of £10 per share, the first half payment of £15 per share being due on the 5th of December, 1872.

Labourers' Dwellings in Ireland.—In answer to Mr. Whitwell, in the House of Commons, on Monday last, the Marquis of Hartington stated that he hoped the Government would be able during the recess to consider the subject of labourers' dwellings in Ireland, and that with a view of facilitating such consideration the Poor Law Commissioners had, on his suggestion, issued a series of questions to their inspectors for the purpose of obtaining information on several points connected with the subject. The whole, or any rate the greater part, of their reports had now being received, and they contained much useful information which would no doubt be laid upon the table of the House next Session, and which probably would form the foundation of a satisfactory measure on the subject.

The Euphrates Valley Railway.—The report from the select committee on the suggested new railway to India has been issued. The committee are of opinion that the two routes, by the Red Sea and by the Persian Gulf, might be maintained and used simultaneously; that at certain seasons and for certain purposes the advantage would lie with the one, and at other seasons and for other purposes it would lie with the other; that it may fairly be expected that in process of time traffic enough for the support of both would develop itself, but that this result must not be expected too soon; that the political and commercial advantages of establishing a second route would at any time be considerable, and might, under possible circumstances, be exceedingly great; and that it would be worth the while of the English Government to make an effort to secure them considering the moderate pecuniary risk which they would incur. They believe that this may best be done by opening communications with the Government of Turkey.

Ornament v. Utility at S. Paul's.—A correspondent of the *City Press* writes:—"The severe thunderstorm which passed over the City on Tuesday [the 23rd ult,], accompanied as it was with very powerful and vivid lightning, naturally caused great anxiety in the minds of many citizens for the safety of our public buildings. On reading of the injury done to Brixton Church, it occurred to me to inquire whether S. Paul's Cathedral is protected by lightning conductors. I find that the two towers facing Ludgate-hill are fitted with conductors, but the dome and main buildings have no protection whatever against such an accident. The effect of the dome being struck by the electric fluid would be disastrous beyond estimate. Now, while such necessary procautions are neglected, men are actually employed to clean the walls of the crypt, and some are even now engaged in gilding the arches under the dome, which might at any moment be destroyed. Hundreds of pounds have also been spent in erecting just inside the north door what looks like the railway tanks in use at some stations, where they are raised on pillars to feed the engine boilers. Surely it is time some one attended to se before ornament."

Boiler Seatings.—In the last monthly report of the Manchester Steam Users' Association, we read that during the month two explosions had arisen from boilers not under the inspection of the association, injuring eight persons, though fortunately not fatally. The cause of one of these explosions, which had been investigated by an officer of the association, was found to be the same as that so frequently met with on previous occasions —viz., the use of an old worn-out boiler, the plates along the bottom, where resting on the brickwork, having been reduced by external corrosion till they had become as thin as a sheet of paper. This corrosion was greatly accelerated by the fact that the boiler was not set upon suitable seating blocks, but let down on to the solid brickwork with wide seatings, which harboured moisture, and thus promoted the corrosion. The entire boiler had been thrown from its seat, and a considerable portion of it hurled across a deep ravine to a distance of 120 yards. The roof of the boiler house had been blown up and the slates scattered in all directions. It was a wonder that no loss of life resulted. Competent inspection would have prevented this explosion.

Trade News.

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Glasgow.—The Glasgow masons strike, which has now lasted for nine or ten weeks, has been brought to an end. The general meeting of the Glasgow Master Masons' Association was held last week in the Trades Hall, when a resolution was unanimously adopted agreeing that, on and after Monday the 5th August, the claims made by the operatives of 7d. per hour and weekly payment of wages should be conceded.

London.—The meeting between the masters and men last week came to nothing from the want of power on the part of the men to settle anything. Nothing in the general position of affairs has changed, except that the men are said to be somewhat impatient and desirous of a change in the conduct of the strike. At the present time there are 55 building firms for whom carpenters and joiners are prohibited from working. The number of joiners now on strike against these firms is about 1,600, the numbers a few weeks since having been about 2,000, but reduced by the men having obtained employment at other firms either in London or the provinces, and a few desertions. Within the last fortnight about three-fourths of the above firms have succeeded in obtaining a few men, chiefly from the country, or Londoners who would not be employed on ordinary occasions, and with their limited staff manage to execute their most pressing work. Some of these firms have also received material assistance from what are called "machinists," or "machine joiners," several of whom have deserted the strike and resumed work upon the tempting offer of 10d. and 11d. per hour. A plan is now before the committee by which it is proposed that the whole of the 55 closed firms be at once thrown open to the trade, with the exception of six of the most important who have the largest contracts on hand, and against whom the whole force of the movement should be directed. The number of men on strike would thus at once be reduced from 1,600 to 600, and the 1,000 struck off the strike-roll would fill the reopened firms and become contributors to the strike fund, instead of recipients from it, and thus the strike income would be increased by £150 or £200 per week. The 1,600 men now on strike are receiving 12s. per week, requiring an income of about £1,000 per week; but it is doubtful whether the non-society men with families can keep out many more weeks upon that sum. If the men on strike were reduced to 600—a number quite sufficient to fight the battle—the income, which would probably increase rather than decrease, would enable the committee to double the present strike allowance. Although the Masters' Committees have adjourned for a month, their agents are busily employed in hunting up men in the provinces, especially in the west of England, where there is not much Union influence, to fill the London shops and jobs. They have not as yet succeeded in obtaining many men capable of undertaking the "fixing" work, but they have got together a goodly number of men who can do the rough carpentering work on outdoor buildings. They are also offering liberal wages to the outdoor foremen and machine hands among the hands on strike to tempt them into the shops, and in some cases have been successful. It was reported to the Central Committee on Saturday that two of the large firms intend opening in a few days at the "nine hours and ninepence," but without a code of working rules, as a test.

Newcastle.—The house carpenters and joiners have resolved to strike unless an advance of 2s. per week on their wages is granted.

Preston.—The stone-masons in Preston are at present out on strike, in consequence of the masters refusing to accede to their demand of an advance of wages of 6d. a day, and 6d. a day extra, as expenses, for every mile they are employed beyond the boundaries of Preston.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

Bedford.—For the erection of a villa residence, Bromham-road, Bedford, for G. Langley, Esq. Mr. John Day, architect. Quantities supplied:—

Corby & Son	£1215	0	0
E. Haynes	1209	0	0
Carter	1196	0	0
Cunvin	1173	0	0
Richards	1127	13	6
Smith	1105	0	0
Litchfield	1065	0	0
W. Haynes	1065	0	0
Spencer	1048	10	0
Lilley (accepted)	1024	6	0

Birkenhead.—For the erection of a pair of semi-detached villas at Birkenhead. Mr. Charles Aldridge, architect. Quantities supplied by Mr. L. C. Riddett:—

Burroughs	£3558
Nicholson & Ayre	3247
Forde (accepted)	3053

Wetheral (Cumberland).—For restoration and refitting of the parish church, Wetheral, Cumberland. Mr. Withers, architect:—

	Nave.	Chancel.	Tower.
Cruiston	£926	£544	£517

Colchester.—For the erection of new corn stores at Colchester. Mr. H. Baker, architect, North Hill, Colchester:—

Dobson	£998	0	0
Everitt & Son	834	10	0
Shepherd	830	0	0
Lee	799	10	0

Croydon.—For the erection of a Gothic villa, Park Hill, for W. White, Esq. Mr. H. A. Alexander, architect. Quantities by Mr. Henry Laxton:—

Waller	£3445
Smith	3142
Mansbridge	3000

Driffield.—For the erection of four villa residences on the Bridlington-road, Driffield. Mr. J. F. Shepherdson, architect. Bricks, fire-grates, and chimney-pieces supplied by the proprietors:—

Bricklayer.			
Leason	£798		
Dalton	692		
Carpenter and Joiner.			
Barnes	£1260		
Adamson	1075		
Foster & Son	885		
Plumber, Glazier, and Painter.			
Ward	£310	14	0
Cherry	290	0	0
Hall	280	0	0
Stonemasons' Work.			
Hickson	£114	0	0
Smith	93	2	0
Slater.			
Wilde & Son	£97	0	0
Smith & Co.	88	0	0
Dawber & Son	76	10	0
The Whole Work.			
Barnes	£2518		
Whiting	2320		
Berry (accepted)	2025		

Eastbourne.—For the erection of master's residence and boarding-house for the Rev. G. R. Green, M.A., Eastbourne. Mr. H. Euean Rumble, architect:—

Peerless (first contract)	£8500

Eltham.—For alterations and additions to Mottingham Lodge, Eltham, Kent, for Alexander McEwen, Esq. Mr. E. Welby Pugin, architect. Quantities supplied by Mr. R. O. Harris:—

Lascelles (accepted)	£1780

Hertford.—For alterations and additions to All Saints' Church, Hertford, for the churchwardens. Messrs. W. Wilds & Son, architects. Quantities supplied:—

Parkins	£745
R. & W. Andrews	710
Norris (accepted)	680

London.—For rebuilding No. 35, Maiden-lane, Covent-garden, for Mr. Benjamin Rule. Mr. Alfred Cross, architect:—

Patman & Fotheringham	£2420
Perry & Sons	2394
Hart	2356
Colls & Sons	2333
Newman & Mann	2325
Willson Brothers	2257
Howard	2146

London.—For rebuilding 79 and 80, Baker-street, and 51, George-street, Portman-square, for Mr. William Robinson. Messrs. New & Cumings, architects. Quantities supplied:—

Foster	£5830
Simpson & Son	5648
Brown	5575
Ebbs & Sons	5322
Harris & Sons	5286
Thompson & Smith	5187

London.—For alterations and additions to No. 388, Edgware-road, for Mr. F. Cowper. Messrs. New & Cumings, architects. Quantities supplied:—

Thompson & Smith	£955
Brown	945
Harris & Sons	937
Ebbs & Sons	933
Mark	925

Salford.—For alterations and additions to Christ Church Rectory, Salford. Mr. John Lowe, architect, Manchester:—

Neill & Sons	£1016	0	0
Clay & Sons	991	0	0
Southern	980	0	0
Terras	930	0	0
Davies & Mawdsley (too late)	887	0	0
Wood	817	0	0
Wilson	806	16	0
Napier (accepted	772	17	0

South Kensington.—For the erection of S. Luke's Church, Redcliffe square, South Kensington. Messrs. G. & H. Godwin, architects. Quantities by Messrs. Gardiner, Son, & Theobald:—

	Without tower and spire. £	With tower and spire. £
Hibbins	12216	15460
Perry	11913	14965
Nightingale	11849	14680
Myers	11736	14720
Manley & Rogers	11699	14125
Avis	11678	14570
Cowland	11478	13808
Adamson	11435	14225
Hill, Keddell, & Waldram	11366	13794
Henshaw	11120	13595
Dove	11078	13626
Hill & Sons	10911	13234

Ware.—For building five houses in Warner's-road, Ware. Messrs. W. Wilds & Son, architects, Hertford:—

	Design No. 1.	Design No. 2. Extra bed-room.
Ekins (too late)	1108	1223
Castle	1050	1200

Ware (Union Workhouse).—For a double system of drainage, to exclude the rain and storm-water from the sewer, and two rain-water tanks, for the Board of Guardians. Messrs. W. Wilds & Son, surveyors, Hertford. Schedule of prices for the works—Mr Fred. Hitch accepted.

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Quarrymen and Stone Merchants.
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(*Less costly than ordinary Gothic Tiling.*)
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	Per 1,200 Slates.	Equivalent to per square
Best Green Slates 14 by 7	2 17 6	16s. 6d.
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Do. do. 13 by 7	2 5 0	14s.
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Do. do. 12 by 6	1 7 6	11s.

Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to
MESSRS. RANDELL & CO., Corsham, Wilts.
Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

Batley, August 15.—For plans for setting out a close of land adjoining the Public Hall. Premiums of £25 for the best, and £10 for the second best designs. —Mr. Thomas Dean, Town Clerk, Batley.

City of London, September 5.—For designs and tenders for the execution of a medal, to be struck as a memorial of the late National Demonstration on the visit of Her Majesty to the City on the Thanksgiving Day. Woodthorpe, Guildhall.

Grays Thurrock (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

Oban, September 12.—For designs for a new church. A premium of £25 will be given for the most suitable design.—Mr. James Nichol, Banker, Oban.

Stockton, August 17.—For designs and estimates for a public exchange, hotel, bank, post and telegraph-office, club-room, sale-room, general offices, and cellarage. Premiums—£50 for the best, £25 for the second, and £10 for the third best designs.—Mr. J. Settle, Secretary to the Stockton Exchange Company, Stockton-upon-Tees.

Sunderland School Board, September 2.—For plans and elevations for school buildings to be erected in James Williams-street. Premiums of £20 for the best, £10 for the second best, and £5 for the third best designs.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded t the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

Watford, August 17.—For designs and estimate for a building to be used as a Public Library. Premiums of £21 for the best, and £10 10s. for the secon best design.—Rev. Newton Price, Belmont House near the station, Watford.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

Acton Local Board, Aug. 13.—For the supply o 500 tons of granite, syenite, or any other hard an suitable road stone.—E. Monson, C.E., Surveyor to th Board, High-street, Acton.

Bombay Street Tramways, Dec. 1.—For th concession of the right to lay down and work for thre years, tramways in Bombay.—Messrs. Smith, Fleming & Co., 17, 18, Leadenhall-street, E.C. Tenders to b sent to the Municipal Commissioners, Bombay.

Brighton, August 12.—For the completion of th Brighton Intercepting and Outfall Sewers.—Mr. F. J Tillstone, Clerk to the Board, Town Hall, Brighton.

Canterbury, September 2.—For proposals fro persons or companies willing to accept a concession o sewage for a term of years.—Mr. R. W. Flint, Clerk t the Local Board, Canterbury.

Chelsea, August 13.—For the erection of an infi mary at the workhouse.—Messrs. Giles & Goug Architects, 28, Craven-street, Strand, W.C.

Cheltenham, August 15.—For the erection of th Delancey Fever Hospital.—Messrs. Middleton & Goo man, Architects, Cheltenham.

Crystal Palace Park Estate, August 12.—Fo the erection of a house on Plot 6.—Mr. J. Norto Architect, 24, Old Bond-street, W.

Dundee, August 20.—For the supply of a new fou ton portable steam-crane.—Mr. D. Cunningham, Ha bour Engineer, Works Office, Harbour-chamber Dundee.

Edgeware, August 19.—For the supply of Guerns granite or other hard stone, also double-screen gravel, and surface hand-picked flints.—Mr. W. Tootell, Clerk to the Highway Board, Court Hou Edgeware.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 16, 1872.

BRICK-BOX ARCHITECTS.

JUDGING from the London buildings of the last few years, one might say that every incompetent mason sets up as a carver, and every incompetent architect relies on such a carver to save him. Not a few so-called designers have abandoned even the attempt to design; the form, the outline, the proportions of their work, never receive a thought; the details are the stock ones of the office, and they are jumbled together just as chance may direct. There is not a vestige of architecture about the whole production; the new bank, or office, or warehouse, is simply a square box with several rows of holes in it. Ask the deviser of one of these abortions what was the use of employing him, and what he has done for his commission, and he will talk to you in a style of indignant virtue about the importance of practical matters. He, it appears, is a practical man, and he concentrates the powers of his lofty intellect on planning and construction. Any one, he will tell you, can design a fine elevation, but to produce such arrangement as his is a different matter. The arrangement, by the way, in the case you may be asking about, probably comprises half a dozen rooms one above the other, and a staircase leading to them; all of which are put together just as they have been hundreds or thousands of times before; while all the construction consists of a few beams carried by iron story-posts, and a queen-post roof to crown the whole. A carpenter's apprentice might have made the design, and a builder's office-boy the drawings, and neither of them would have earned any particular commendation by the feat; but the city architect, by incessantly repeating it, contrives to gain something of reputation as well as fortune. A great help to this end is the zealous disparagement of better men than himself. Our brick-box maker, who, perhaps, never in his life produced a feasible plan of his own invention, modestly takes it for granted that only he and the likes of him know anything about planning at all. He looks about him, and if he sees—whether in a school competition, or in a town-hall, or a private residence, or anywhere else—a work which speaks for the art faculty of its maker, his one resource is instantly to assume that its arrangement is a failure, and to proclaim this, with all the power of his lungs, to a gullible public. In this happy land he may congratulate himself that the public is an extremely gullible one. It might be supposed, now that neighbouring nations are rapidly coming to equal us in our only forte, mechanical skill, while they are beating us out of every market by their superior taste and ability in design, that architecture, as the foundation and root of all arts and art products whatever, was worth some encouragement. It might be supposed that however repulsive thought and refinement may be to a large stratum of the English middle class, the perception that these things had a commercial value might render them endurable. It may do so ultimately, when, perhaps, it will be too late; but at present there is no shorter road to the confidence and respect of a popular assembly than to speak of them with contempt. It is less than a month since, as we recorded, the London School Board were treated (whether to their satisfaction or disgust we know not) with a specimen of the kind. Architects were indiscriminately censured for being indifferent to planning; but those who also attended to design came in for far the heaviest share of the blame. So it always is with critics of the brick-box tribe. They always set out with this amazing assumption, that the man who has not brains enough to design an entire building is sure to be the best man to arrange its planning and construction. So proud are they of their own incapacity that they refuse credit for common sense to all but their fellow sufferers. They cannot understand how any one can attend to planning *and* architecture; they fancy all the world, like themselves, to be deficient in one or the other half of the mental faculties, and that the only question is, which half is wanting. They cannot be persuaded that he who has the rare talents on which architecture depends may also have enough practical wisdom to put kitchens and staircases in the most convenient places. Their reasoning power, in short, seems pretty much on a level with their artistic power, and they themselves supply a quite sufficient proof that imbecility in one direction is very far indeed from being a guarantee of ability in another. The only reason for noticing them is that their nonsense happens to suit the nonsense of the more ignorant stratum of the middle class, and that the name of architect, which they unworthily bear, enables them to nourish more effectually the vulgar prejudices around them.

We have not, however, as yet, fully described their works, or, more correctly speaking, the works which bear their name. As far as the "designer" goes, they are what we have called them—mere brick boxes, sometimes with a thin coating of stucco, sometimes again with a thicker one of stone. There are so many rows of holes one above another, by way of doors and windows, there is a cornice and a parapet, and there the matter ends. There, at least, it would end, if no one save its nominal author had to do with it, for he has done his best and can do no more. There is, however, a longing in human nature for beauty of some kind; a taste which, though it may be distorted and corrupted to any extent, still appears in one shape or another. Even our brick box-maker, after all his professions of practicality, is obliged to recognise it, and since nature has left him unable to gratify it, he is obliged to discover some one who can. He falls back, as his only resource, on the stone-carver, but as his mental peculiarities do not allow him to know good carving from bad, and as the manufacturers of the latter are in a large majority, it is nine times out of ten one of them whom he chooses. Every here and there our "designer," in making his elevations, puts in a block of stone with plenty of superfluous material. The walls built, he turns the carver loose on them to follow his own sweet will. The brick-box remains a box, as it always must remain, but it is now a box covered with frippery. The cheap finery with which the carver bedizens it we have all seen a hundred times before. In that very street, it may be, he has already put dozens of yards of his regular crochet cornice, or scores of his flabby naturalistic capitals. The poor man, we might imagine, is ready to hang himself from the sheer monotony of his occupation. He and his fellow labourers, in their daily drudgery, have helped to spoil half the buildings in the neighbourhood, and still the process goes on. This one, however, cannot well be spoiled. The carver and the architect are worthy of each other, and though the result is nauseous to healthy senses, too many of the beholders like it. There is no accounting for tastes when the digestion is depraved. The lady in the "Spectator," who stopped her carriage as she saw a flock of crows dining on a dead horse, and begged the footman to cut her off a slice as if it were for himself, could not have found many friends to share her repast; but had her disorder been a mental instead of a bodily one there would have been no singularity about it. A long course of unwholesome diet has vitiated popular taste in all matters of art; a demand for trash has arisen, and the brick-box architect and his carver are the purveyors who supply it.

FURNITURE, BRONZES, AND OBJECTS OF VERTU, IN SIR RICHARD WALLACE'S COLLECTION AT BETHNAL-GREEN.

VISITORS to Bethnal-green must not allow the great attraction of the paintings to make them forget that there are many other things quite as valuable in their way as the pictures. It is hard to imagine a more complete series of French furniture from the time of Louis XIV. than that which Sir Richard Wallace possesses. As with the china of the same times and country, the shapes are usually very clever, but too elaborate and fantastic. There is a great want of simplicity of outline. The ornamentation also is, in many cases, overdone, but the workmanship is almost always quite admirable, and the amount of pains and cost expended something entirely beyond anything done in the present day. The three points most worthy of notice are the great skill exhibited in inlaying metals and coloured wood, the extraordinary delicacy and merit of many of the metal mounts, and the exquisite Sevrès china plaques inserted in the panels, &c. The examples of inlay of metals, principally in the Boule work, are very numerous and splendid, and date from the end of the seventeenth century. There are several grand specimens on the ground floor—mostly high cabinets and clocks with massive and well-chased mounts in gilt brass. There are also some especially good coffers upon their original stands. Quite the finest thing of this kind is a chest of drawers on the ground floor (1335). It is not only black tortoiseshell and brass, as most of the other pieces are, but is inlaid with silver, mother-o'-pearl, and ivory, the whole being a wonderful exhibition of inlaying skill. There is a good deal of colour also introduced. The handles and other ornaments are so well chased, and so richly gilt, that they seem to be of solid gold. The slab at the top is also a very rare and beautiful one. Only two small specimens can compare with this masterpiece—viz., the toilet mirror (1171), which is ornamented on all sides, and is as fine as possible, and a casket (1174).

One of the most curious and rare suites of furniture, though not so attractive as the best Boule or the elegant Louis XVI. work, is the set of green Vernis-Martin library furniture, Nos. 1158, 1159, &c. This perfect varnish is more valuable when used for snuff-boxes and highly decorated articles. If furniture painted by great artists is ever to become fashionable in high places, the paintings should be protected from injury by such a varnish as this.

There is no question as to which is the most beautiful piece of marqueterie, though there are several other excellent cabinets, but No. 1163 fairly surpasses everything of the kind in the whole collection. It is a writing-table or bureau, made for Stanislaus, the King of Poland, by Riesener, the prince of inlayers in wood. There was nothing he could not do—imitate marbles, give the anatomy of figures perfectly, represent flowers and fruit, the sky, and landscape. The medallion of "Silence" at the back is especially to be noticed. Visitors should compare with this No. 1154, the inlaying of which is by David, and No. 1090, in which there is some very skilful work—some dancing boys on a vase are equal to Riesener's work. This piece is inscribed "Foulet." No. 1069 is also very good. It is a pity that this part of the exhibition has not been better catalogued —many more of the pieces might have been identified as the works of known masters. Some of the dates given are very far out. For example, No. 1083 is said to be early eighteenth century. It is very fine, but certainly very late eighteenth century. No. 1010, &c., are said to be sixteenth century bronzes, Italian. They are certainly eighteenth century French; and, what is more amusing, a bronze of precisely similar quality, if not actually belonging to the same set (No. 1006), is correctly described. Again, a fine series of groups (Nos. 1143 to 1146), are all said to be Italian of the sixteenth century. They are certainly a hundred years later, and we should say that they were French. The specimens of furniture ornamented with Sevrès plaques are very numerous and fine; among the best are No. 1117, a very charming cabinet, inlaid with coloured woods, and having very choice plaques with a green ground. The mounts are also capital, particularly elegant, and tasteful. Nos. 1111 and 1122 are also representative examples. There is one other description of furniture of a very high quality, which is to be seen in the greatest perfection here—viz., that made of rich wood, with no other ornaments than the ormolu mounting. The greatest artist who did this sort of work was Gouttiere. There are several beautiful works of his, among them a pair of high cabinets of Amboina wood, the best being No. 1119. Nothing can surpass the wonderful delicacy of the chiselled flowers and other decorations. There are several other pieces, which are probably from his hand, though not so described. Nos. 1061 and 1062 are known to have been executed by him. Of the furniture of the latter end of the eighteenth century there is a very interesting case on the ground, containing two corner cupboards, two tripods with splendid candelabra, and some cabinets lighted up by some exceedingly choice pieces of china, an inkstand of green Sevrès porcelain, with a hen and chickens at the top, being one of the best in the place. This whole case gives an excellent idea of how the rooms furnished with such furniture looked.

There is a grand collection of bronzes of France and Italy, both of a very high order, but too numerous to specify. The finest of the former, as it is one of the best things of the kind in Europe, is the bust of Charles IV., of France (1379). This is a superb monumental work, of which any nation might be proud. On either side of it are Cupids of the finest Italian work. A very characteristic French work is (1161) an allegoric group, representing the fortunes of the young Louis XV. Time is offering him his scythe, Health and Art support him, while Vice shrinks into the earth at his feet. It reminds one of Edelinck's great print of the Triumph of Louis XIV. Every one should notice the very choice bronzes scattered about among the Sevrès china in the South gallery, and more especially in the side cases of the same gallery. Nos. 1202, 1203, and 1204, of the sixteenth century, leave nothing to be desired. How very tame do such bronzes as (1182) "The Empress Josephine as the Genius of Painting" appear after such gems as these! Some of the larger bronzes on the ground floor are of first-class merit—*e.g.*, the Juno and Jupiter, and the rivers Tiber and Nile.

There are only three or four ivory carvings, but all of the first quality. No. 1187 is a diptych with the various subjects of our Lord's Life and Passion, beginning at the bottom of the left side and finishing at the bottom of the right; it is of German work, late thirteenth or more probably early fourteenth century. It has become too much the fashion of late to give too early a date to ivories and manuscripts. We have seldom seen so beautiful an ivory carving as No. 1185, a group in high relief, said to represent the "Toilet of Venus," though it really is a classical design of David seeing Bathsheba at her bath. Last of the three, and by no means the least, is No. 1186, a Satyr teaching a girl to play upon the pipe—Italian (?) sixteenth century. This piece shows amazing skill; it is full of grace. Not only are the principal figures so charmingly suggestive of the golden age, but the landscape and figures in the distance are alike equally delightful; all is sun, repose and happiness. No. 1172, a curious and very rare steel casket, is well worth study, as showing what may be done in gold and iron by the various processes of damascening, sinking, engraving, &c. The arabesques in low relief are very nice. We next turn to the two cases at the end of the Sevres gallery, containing bijouterie and plate. There is not much plate, but what there is is as good as can be. No. 1235, a German drinking cup in the shape of an ostrich, with a very elaborate repoussé base of the end of the sixteenth century, is interesting, but somewhat damaged by time. Nos. 1233 and 1234 are exceptionally fine for English work of the eighteenth century. No. 1240 is also a capital bit of English silver. The fashionable possessors of English silver have, as a rule, so utterly destroyed all of its interest by regilding and furbishing it up, that it is quite refreshing to see a collection of it in its original state. A great part of our early English plate has been as badly or worse treated by so-called restorers than our churches and cathedrals.

The whole of the next case will repay most careful observation. It abounds with beautiful things, many of which are not specified in the catalogue, and may be missed if not looked for. At the top there is a remarkably fine fifteenth century German clock, of silver gilt and enamel, adorned with Renaissance ornament. In the panels are subjects covered with translucent enamels. There are also alternately with these, astronomical medallions, painted under glass. Some of the jewelled Indian weapons are perfect. A Malay crease, with Jade sheath, puzzles one to imagine how it was wrought. There is on the other side of the case an Indian dagger, with a Jade handle, the blade of which is marvellously embossed and damascened. No. 1243 should be noticed. It is a bowl of very pure crystal, with Persian ornamentation in enamel in excellent taste. Among the rest are also some beautiful things, sent out, doubtless, as presents from France to Eastern potentates, which have found their way back again, the best of which is a dagger, exquisitely enamelled, of late eighteenth century work.

It would be impossible in the small space we have left to do justice to the small but almost matchless collection of snuff-boxes. One can hardly understand how such wonderful things should have been produced for such a purpose. The original cost of some of them must have been prodigious. It must suffice to say that those who are curious in such matters may see the finest possible specimens of every description. We certainly never saw anything to approach the Vernis-Martin boxes. There are also excellent portraits by Petitot; and specimens of enamelling after Watteau, Bouchet, and the later decorative designers, enough to rob many a collector of his rest for weeks to come. Let no one omit to look at the row of pendants at the top of this case, and the lovely Chinese cups of beaten gold, with thin turquoise enamel run into the gold chasings. We can only notice one or two of the rarest or fairest—for example, the Holbein jewel, of a lady with a mirror with translucent enamel, the flesh being done in opal. There are two charming lady's watches in crystal and enamelled cases. If any one wishes to see an absolutely pure piece of crystal cut into a most elegant vase, and ornamented in the finest taste, he can see it in this case. Lastly, we must draw attention to a very small but very choice medallet of a rare and curious description of late fifteenth century work, with the figures of Charlemagne and S. Louis chiselled out like the finest thirteenth century plaques, the dresses being filled in with transluscent enamel. Designers of ecclesiastical plate and choice metal work would be wise to study this little gem. It may be little more than a toy, but it may give valuable instruction to those who can read its lesson. All we can say in conclusion of the great collection of miniatures is, that we heartily wish that so fine a collection had been more adequately catalogued. We still hope that this may be done. Many of them are by well-known artists, though they are not so described. There are, for instance, especially good specimens of Cooper. The portrait of a lady unknown (1626), signed "P. L." is, of course, by Peter Lens—*i.e.*, Paul Peter Lens, the son of Bernard Lens, who painted occasionally better than his father. Still, with or without a correct catalogue, the miniatures will repay more than one careful visit.

We cannot close our notice of this wonderful collection without thanking Sir Richard Wallace for the many pleasant hours we have already spent in reviewing the treasury of fine things that he has so nobly lent specially to a neighbourhood that has so few joys. We feel sure that his kindness will produce the greatest good.

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THE IDES OF MARCH.

CANDIDATES for the ensuing Voluntary Architectural Examinations are to declare themselves on or before the end of March next. The whole scheme of this laudable Institution has been once more revised. Whether or not this is to be the last revision, we cannot say. This is, however, the very last of very many revisions. The Institute has piped to different tunes, but the students have mostly hitherto turned deaf ears to their would-be charmer. By all evidence, however, the apathy thus displayed was but natural, for the tunes were not to the taste of those to whom they were addressed. Now, however, we are assured all is changed. The vexed question of the diploma has been practically conceded, and eleven gentlemen actually enjoy the substantial title of "Graduate of the Royal Institute of British Architects." Long may they live to reap the fruits of the coveted honour, and may these prove equally, nay, even more substantial! Yet eleven certificates, though each be regarded "as a diploma of professional qualification," is not a liberal result for a system of examination, established for at least half that number of years. The number of passed candidates may slightly exceed that of their examiners, but it will hardly pay to set such distinguished engines to work to crack nuts, unless a larger proportion of work can in future be expected from them.

Many reasons, however, have been alleged for the rising men of the profession keeping aloof from this salutary ordeal, and among these the absence of a sufficient recognition of success has ever been put forward as the most prominent. The champion Eleven of All England were not allured by hope of such, for to them it was denied, but that they should retain the belt without challenge was attributed to the withholding from others of that guerdon, which it is considered only human to covet.

By the readjustment of the Institute examinations, which has been designated as final, and may be relied upon as such for, at least, one twelvemonth to come, an academical title will be conferred upon the successful candidates. The programme for that for the year 1873 has been issued, and the labour it will entail upon the students is certainly not onerous. One week in the month of May every alternate year will alone be occupied, and that will be divided between the artistic and scientific lectures, three days being given to each, and at the candidate's option, one only or both of these may be encountered upon the same occasion, the diploma, of course, being withheld until they have passed in both. Thus, if learning itself be not made easy, the proof of its acquisition is certainly proposed to be. This, however, is to be limited, as regards the proficiency examination, to such "acquaintance with each subject as any well-educated pupil coming up shortly after the creditable conclusion of his articles may reasonably profess to exhibit." A triple privilege will now be attached to success in this not over-arduous enterprise. First, the studentship of the Institute for three years without fee; secondly, the subsequent nomination by Council for the

Associateship without the necessity of the usual recommendation by three Fellows from personal knowledge; and thirdly, after election as an Associate, the distinction of the title of Graduate of the Royal Institute of British Architects. Taking it for granted that the representations to which the Institute has now yielded were based upon fact, and that nothing but the want of some such rewards as are now offered has hitherto restrained the younger men of the profession from competing in these examinations, we now look forward to the members of the Architectural Association and others crowding to avail themselves of the opportunity they have so long professed themselves to be waiting for. We hope that the next Ides of March will bear testimony to their earnestness to show that they have attained proficiency in the several branches of architectural education set forth in the curriculum, and that as the examinations are henceforth very judiciously arranged only to be held biennially, instead of annually as heretofore, that they may never again have to be postponed for want of a sufficiency of candidates. For the formation of the Class of Distinction we shall be content to wait awhile, since it is to be directed towards "very high attainments on the leading subjects of either the artistic or scientific section," and we had better ascertain first that we can walk before we strive to run.

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CRITICAL NOTES ON GREAT ITALIAN ARCHITECTS.—XVI.

By J. B. Waring.

BERNINI, 1598—1680.

GIOVANNI LORENZO BERNINI, son of Pietro Bernini, sculptor, though born at Naples, where his father was then employed, was, like so many of the greatest artists of the time, of Tuscan race. His father being engaged by Pope Paul V. (C. Borghese) to execute some sculpture in the Borghese or Pauline Chapel at S. M. Maggiore, Rome. Milizia states that at this time, or in the young Bernini's tenth year, he sculptured a marble bust, now in the Church of S. Praxede, representing Monsignore Santoni, placed above his monument. "The infant prodigy," for as such he was speedily regarded, attracted the notice of Paul V., who recommended him to the care of Cardinal Barberini, a great patron of the arts and literature, "in order that the seed might be sown to produce another Buonarotti." There is, however, no recipe for forming a Michael Angelo, and great as were the youth's talents, he had not the stuff of that nature in his composition. His precocity and ability were, however, manifest, and there are two marble groups still preserved in the casino of the Villa Borghese, one of Æneas carrying his father, Anchises, stated to have been executed in Bernini's fifteenth year, and Apollo and Daphne, in his seventeenth year. One of his finest works, that of David slaying Goliath, is also in this casino, as well as marble busts of Paul V. and the Cardinal Scipio Borghese. Indeed, so greatly was Bernini admired and flattered as a youthful prodigy, that he might have been spoilt but for the good advice of his father, who instilled into him the principle that he could never do so well but what he might yet improve himself. Bernini's genius was accompanied with unwearying energy and industry, and he studied architecture as well as sculpture whilst still young. Gregory XV., who succeeded Pius as Pope in 1621, kept our artist in full employment, gave him a regular pension, and made him a "Cavaliere" of the order of Christ. Under Urban VIII. (M. Barberini), who succeeded to the Pontificate in 1623, Bernini's fame was fully established, and he was constantly engaged on important works in architecture and sculpture, principal among the former being the celebrated "baldacchino," or canopy over the high altar beneath the dome of S. Peter's. It is, perhaps, the largest bronze monument existing, being about 95ft. high from the floor, and was cast from Bernini's design in 1633, a great portion of the metal being taken from the Pantheon, which gave rise to the satire of Pasquin, "Quod non fecerunt Barbari fecerunt Barberini." Its twisted columns and extravagant ornament and gilding bespeak also a "barbarous" character; we confess we can see no merit of any kind in it, unless size and a lavish expenditure, which attracts the vulgar admiration, can be considered commendable. Kugler describes it as an "affektirt imposantes dekorations werk;" but it is irremediably bad, and were Bernini's claims as a good designer to rest on this work alone, he must be classed very low in the scale, nor would the great bronze pulpit, with its colossal bronze figures, all in equally bad taste as the baldacchino, serve to raise him in our estimation; but he should rather be judged by those architectural works which do him honour, such as the Scala Regia, or royal staircase, leading from the Portico to the Vatican Palace, and the celebrated Portico itself. The Scala Regia is certainly a very impressive work; it consists of two flights of steps, the lower walls being ornamented with Ionic columns, the upper with pilasters, and decorated with rich stucco work by the sculptor, Alessandro Algardi. The great colonnade, which forms so marked a feature in the external effect of S. Peter's, was commenced by Bernini in 1667. Extending in a curved form, like wings, from each side of the building, it (together with the fountains and obelisk of the central space) serves materially to relieve the sprawling heaviness of that colossal piece of ugliness, the façade of S. Peter's. These colonnades are 56ft. wide, and consist of four rows of 284 Doric columns, in all, 48ft. high, and arranged with a broad central passage for two carriages to pass. Imposing from their size, and not bad in effect, they will never be regarded, however, as models of detail by any student. In themselves they are common-place; but they serve their purpose, and, in comparison with the gaudy and meretricious style pervading S. Peter's generally, are quite a relief to the eye from their comparative simplicity. Although these colonnades are generally regarded as Bernini's best work in architecture, we prefer the portions of the Barberini Palace executed from his designs, such as the façade towards the Strada Felice, and the great winding staircase and hall; not omitting the fountain on the piazza, a Triton on a shell blowing a conch, the shell supported by intertwined dolphins, effectively arranged over the principal basin; a very pictorial composition, free from that extravagant aiming after picturesque treatment which mars so much of his work, and which reaches its acme, perhaps, in the fountain of the Piazza Navona. His other architectural works in Rome are the façade of the great college "de Propagandâ Fidê," completed by his rival in architecture, Borromini; the Palazzo di Monte Citorio, completed by Carlo Fontana; the façade of the Palazzo Odescalchi; the Church of Sant' Andrea al Quirinale, generally considered an excellent example of his style; various additions to the Quirinal Palace, and several altars and chapels in the churches of Rome. The Chigi Palace, in a comparatively simple style, and the Church of the Assumption at Larricia (built circa 1664), are often and properly cited as among his best works. "In these two edifices," observes Valery, who is an excellent critic in matters of art, "may be remarked the character of Bernini's talent; a superior architect for effect and arrangement, but bad in details." At Castel Gandolfo, the church, a Greek cross in plan, and portions of the Palace, are by him as well as the Rospigliosi Palace at Pistoia, and the Arsenal at Civita Vecchia.

So great was Bernini's fame, not as a sculptor alone, but as an architect, that he was invited to Paris by Louis XIV. in 1665, and his journey was a kind of royal progress, the highest authorities receiving him with special honours at Florence, Turin, and Lyons; he remained in Paris about eight months, engaged in works of sculpture, and it is honourable to him that he refused to meddle with the design of Claude Perrault for the Louvre, declaring that the designs of so great a master could not be improved by him. Indeed, whatever faults may be found with Bernini's artistic merits, he was, personally, most industrious and independent. He never ceased working on account of the great personages who visited him, and always upheld the dignity of his art and his position as an artist in an admirable manner. He was a sayer of good things, like Michael Angelo, and remarked that "the greatest man was not he who was without faults, but he who committed the least," and this merit in comparison with his co-temporary Borromini may certainly be ascribed to him. It was an age of the decline of good taste in art, and it is not want of power, but want of taste, which precludes Bernini from being placed in the highest rank of artists. He died at Rome in 1680, aged eighty-two, the last great example of a long race of Italian sculptors, who also distinguished themselves as architects.

His style, where he did not depart from the good models of his Roman predecessors, was manly and effective, and he always had an eye for pictorial arrangement; if he had remembered his own saying, that it is "*occasionally* necessary to depart from established rules," it would have been better with him; he, at times, departed from them in a most injudicious and extravagant manner, adopting, as Milizia observes, "broken pediments, undulations, projections, and intermixtures of right lines and curves; instead of a beautiful simplicity, he substituted elegant fancy." The fancy we allow; the elegance is very questionable. He had the making of a good artist in him, but was spoilt by that want of strict discipline, which was never more necessary than in his day; nor can we think that he possessed the imaginative faculty requisite for a great artist. Mr. Huggins, in his excellent little work, "The Course and Current of Architecture," whose criticism is always appreciative and unbiassed, observes that "Bernini has sometimes displayed the highest art in the arrangement of light and in overcoming difficulties of situation, and his efforts are occasionally inimitable. His style presents more license than absolute errors or abuses, and his graces and elegancies go far to atone for his many faults." It is out of our province to criticise Bernini as a sculptor, but there can be no doubt that, led by false principles, he gave an impress to the sculpture of his time which was in itself bad, and led to still worse results, so that in my notes on my first visit to Rome I find the following impression was made upon me:—"Bernini is the curse of Rome." This, however, can only apply justly to his sculpture, for he was much more sober and judicious in his style as an architect, and had it not been for the example of some of his predecessors, notably Michael Angelo, and the necessity of keeping pace with the wild fancies and vagaries of his co-temporary and rival in architecture, Borromini, he might have produced works much more creditable to his good taste and judgment. As it is, Bernini may be regarded as the last of that race of great artists—great in sculpture as in architecture, and possessed of extraordinary natural ability—who cast such glory on the art history of Italy from the fifteenth to the seventeenth century, a period of about 200 years, during which she gave the laws, and presented the models of all that was highest, most beautiful, and most noble in art, not to Europe and her own epoch alone, but to all the world, and to all time. The great Italian artists of the Renaissance and the Italian epochs were a race of giants, as remarkable for intellectual power as for artistic genius, and a natural s ase of good taste, combined with a versatility, energy, industry, and tact, such as render them quite an exceptional set of men, and will always command the respect and admiration of mankind. We recommend their lives and productions to the attention of all students of art, as calculated to be of advantage to them in every way, for, as a rule, they were not only thorough enthusiasts, but were characterised by the energy and industry with which they pursued their studies; they were men of broad views, and gifted with that knowledge of the world, and sense of their own personal dignity, and the honourable nature of their calling, which made them respected even by the greatest monarchs of their time; they eminently knew, indeed, "how to make the best of both worlds," the world of art and the world of actual life; and in concluding these notices of the great architects of Italy, we cannot do better than direct the attention of students to a more thorough study of their career and works, satisfied that they will arise from such study with a deep sense of their worth, and a high admiration of their art; nor will they ever again allow themselves to be so far misled as to speak in terms of wild condemnation, or unjust depreciation of the art and artists of the "pestilent" Renaissance; that Renaissance style, which, originating in Italy in the fifteenth century, has given rise to some of the noblest monuments throughout the world, and is illustrated by a band of the greatest and most accomplished artists of modern times.

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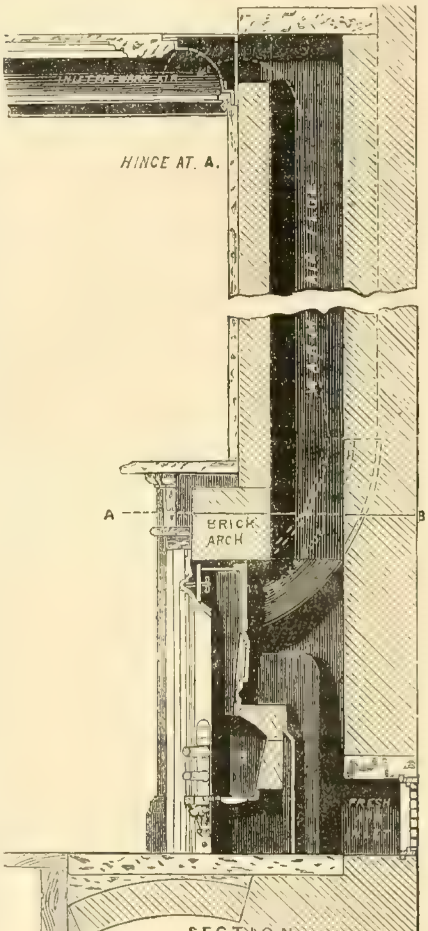
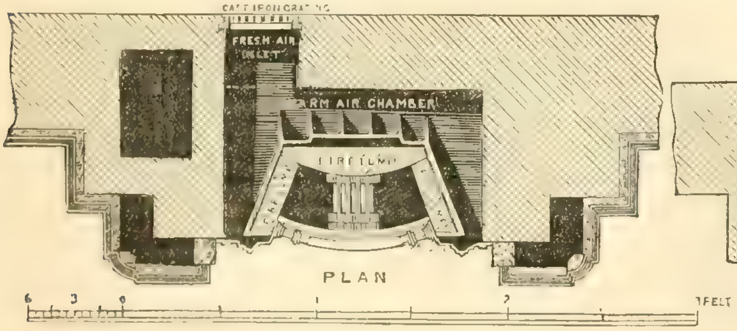
STOVES.

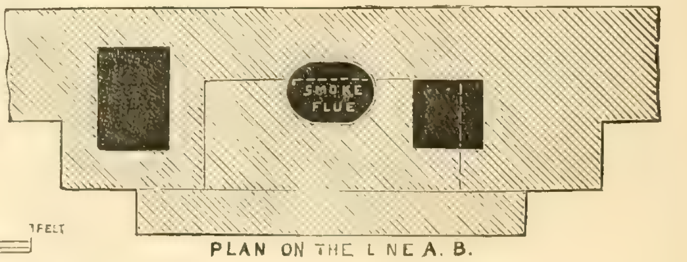
DISRAELI, speaking of new inventions and their frequent failure to accomplish their intended uses, cleverly remarks that they are often "so ingeniously contrived that the very ingenuity prevented them from being useful." Captain Galton, however, in his "ventilating fireplace" has given the world simplicity and utility combined. The plans and section will fully explain the method and action. It will be seen that the fresh air is admitted behind the grate; that it is there warmed partly by the firegrate back and partly by the *gills* affixed (this method of warming air will remind my readers of Goldsworthy Gurney's stoves); the warm air then rises in a separate flue from the smoke flue, and is discharged into the room through the cornice or through louvre opening near ceiling. It will be seen by the drawings that the bottom of the Galton stove is partly solid, only about one-third is open, and this portion has the usual bars across. Another peculiarity is the inlet of air in the back, just above the bars: and the formation of the back of the stove at this part, which, it will be seen, is coved (see D in section).



SECTION
SHOWING OF BRICKWORK AT BACK AND LONG BEND TO SMOKE FLUE



PLAN



PLAN ON THE LINE A. B.

Captain Galton appears to consider this coving very important, its objects being to aid combustion, and to prevent the heat escaping before it has been fully utilised. It is certainly a system of warming and ventilating that deserves every attention. Captain Galton explains that he originally intended his invention to apply to barracks and military buildings (in fact, in the year 1868 he read a paper at the Society of Arts having this limitation); and, therefore, probably the louvre openings were intended to prevent any interference by the soldiers. I think in ordinary houses, however, an improvement could be made by having an inlet that could be regulated at pleasure, otherwise I am of opinion that the down draught would be inconvenient on some occasions. as, for example, when there was no fire. The advantages claimed for the Galton stoves, which, I should mention, are being used at the new Foreign Office and many other buildings, are six in number; and I would refer those who take an interest in this important subject to Captain Galton's most excellent paper to which I have alluded; it will amply repay the trouble. While I was going over the warehouses of Messrs. Yates, Heywood, & Co., the makers of these stoves, I looked at the ranges they have supplied to Peabody buildings. I was pleased with their arrangement of the top bars, which are made so that they can fall down in the usual way, or *inside*—in the latter case it saves utensils and time.

Another modern invention deserving attention is their patent valve for regulating draft (see p. 119), the diagrams of which explain themselves. One charm to my mind is, that if from any cause it is not found to answer, it is of no consequence, as it need not be used, and then the stove is just the same as the ordinary register stoves in general use. The cost is small, only 1s. 6d. additional. The name of this invention would be better understood by the trade, I think, if it were called a *hit and miss* ventilator. This invention appears likely to come into general use.

I had intended to have gone fully into another new invention, but space will not permit. Mr. Magnus is the inventor, and I believe specimens may be seen at his slate works. Shortly, the principle may be thus explained: Keep the hot smoke from the open fireplace in iron pipes as long as you can, and let the heat therefrom get into the room through open ornamental panels in chimney-piece. In hall stoves the iron pipe is carried up to the ceiling before entering the brick flue, and has an ornamental casing of enamelled slate and open iron panels painted, and sometimes gilt.

With coals at their present alarming price (and the probability of a further rise therein) too much attention can scarcely be paid to this subject.

"INVENTIONES SCRUTATOR."

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THE BRIGHTON AQUARIUM.

THIS aquarium was formally opened on Saturday last, and there is no doubt that it is a decided addition to the attractions of Brighton. Externally, the *Brighton Daily News* says, the structure makes very little show, and its first view will doubtless induce a sense of disappointment. It has not inaptly been described as resembling a sunken Italian villa, three parts of which are out of sight, the upper story only being above ground. The roof has been so arranged as to form promenades for those who may desire it. Its entrance is not only unattractive; it is positively ugly. This latter defect, however, will soon be remedied. The Company are endeavouring to obtain the consent of the Town Council to erect a handsome clock-tower and toll-house, and should they obtain the required permission we may expect the neighbourhood to be furnished with another ornament. The interior of the building is as beautiful as its exterior is plain and unsightly. The Gothic style of architecture prevails throughout, giving it more the appearance of an elaborately decorated cathedral crypt than anything else. The aquarium is approached by a broad flight of steps, with ornamental landings, leading into a handsome entrance court, consisting of five arches. This opens into the entrance hall, which is very elaborately decorated, and which will be principally used for lectures, soirées, &c. Leading from this is a long double corridor, which forms the aquarium proper Its total length is 220ft.; but it is broken in the middle by what is called the central court. The corridor is lined on either side with tanks, of which there are 28, ranging from 11ft. to 100ft. in length; the height being 6ft., and depth about a dozen feet. Connected by a cross corridor at the eastern end of the principal one is another similar gallery, 160ft. in length, and containing about twenty tanks. Parallel with this gallery, and immediately following the chief corridor, is a conservatory, 160ft. long by 40ft. broad, and 30ft. high. At the end of the smaller corridor is the machinery used for pumping the water, naturalists' rooms, &c.; and leading out of the entrance court already spoken of is a refreshment saloon, which will be served by Mr. Mellison, of the Concert Hall Hotel. The tanks are fitted up with rockwork of a varied character, consisting of stratified rocks from Nuthurst, near Horsham, other portions being made of tufa fantastically arranged, and in some of the tanks having the appearance of caves. The water, which in the majority of tanks is salt, and in a few fresh, is introduced from pipes at the back of the tanks, where also, above the water's edge, are the doors affording access to the attendant for feeding purposes. The water, however, reaches higher than the top of the plate-glass frontage, so that the whole of the light which is obtained in the corridors is entirely peraqueous; at night the tanks are lit from above with argand lamps and powerful reflectors.

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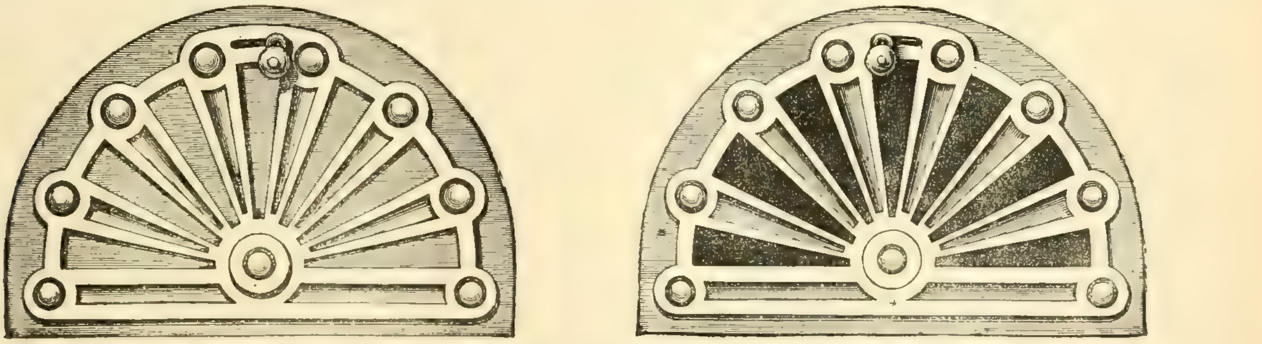
THE NEW LAW COURTS.

THE prospect of seeing the New Law Courts erected on the great space now lying idle near Temple Bar seems to be even more remote than it appeared a few months since. Years have elapsed since the poor folks who inhabited these seven-and-a-half acres of streets and alleys were turned out of house and home at the briefest possible notice. Since then four hundred houses have been demolished, and the waste land has at length been cleared, and the foundations of the new courts proceeded with. The difficulty, however, with regard to Mr. Street's design still stops the way, and it is now officially announced that the whole matter must stand over until the next session of Parliament. All this would, perhaps, be less unsatisfactory if there could be any assurance that next session, with its over-crowded legislation, will leave any time for settling the difficulty; and, unfortunately, architectural controversies appear to be of all contentions, the longest lived, especially when the Office of Works is one of the parties to the dispute. There is, in fact, every probability that the present miserable accommodation for judges, juries, and the bar will outlast at least half a generation; for a building of this kind, even when begun, must necessarily occupy some years in completing. The whole history of these law courts (as our contemporary the *Graphic* remarks) illustrates very forcibly the mischievous propensity of the House of Commons to take a practical part in the regulation of details entirely beyond its grasp. Nothing can be clearer to mere spectators than the fact that mere matters of taste cannot be effectively discussed in a legislative assembly numbering 658 members, and this difficulty rises almost to impossibility when the assembly is already overwhelmed with matters of imperial policy.

Under these circumstances the only course would appear to be that of appointing a Minister of Public Works, and placing confidence in him, while reserving, of course, the right of veto under grave necessity. Any way, the nation requires the law courts, and cannot afford to wait.



PATENT VALVE FOR REGULATING DRAFT (FOR DESCRIPTION SEE PAGE 118).

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LIGHTNING RODS.

THE unusual quantity of lightning and thunder with which we have been visited during the summer has called additional attention to the subject of protecting buildings by properly-constructed conductors. Professor John Phin, of the United States, has recently published a little book on "Lightning Rods and How to Construct Them," from which we cull the following selections:—

Are Lightning Rods Really a Protection?—There are many instances on record where buildings protected by rods have been struck and injured. But this is not to be wondered at when we reflect that fully one-half—nay, perhaps three-fourths—of all the rods now actually erected violate the fundamental principles upon which their efficiency depends. Besides serious errors in regard to arrangement and continuity, it will in general be found that it is only by the merest accident that a good ground connection is ever secured. This point will be more fully discussed in a subsequent paragraph. Meanwhile, the following facts prove irrefragably the great value of well-constructed rods. The Cathedral of S. Peter, in Geneva, although so elevated as to be above all other buildings in the neighbourhood, has for three centuries enjoyed perfect immunity from damage by lightning; while the tower of S. Gervaise, although much lower, has been frequently struck. This doubtless arises from the fact that all the towers of S. Peter are accidentally furnished with perfect conductors. The great column of London, known as the Monument, erected in 1677 in commemoration of the Great Fire, although over 200ft. in height, has never been struck; while much lower buildings in the vicinity have not escaped. The Monument, however, is protected by a most perfect conductor, the upper end terminating in a vase, from which proceed numerous metal plates designed to imitate the appearance of tongues of flame. The vase communicates by means of stout bars of iron with the metal staircase, which descends through the middle of the column and terminates in the ground. A still more striking instance of the value of lightning rods is a church on the estate of Count Orsini, in Carinthia. This building was placed upon an eminence, and had been so often struck by lightning that it was deemed no longer safe to celebrate Divine service within its walls. In 1730, a single stroke of lightning destroyed the entire steeple; after it had been rebuilt, it was struck on an average four or five times a year, without counting extraordinary storms, during which it was struck from five to ten times in a single day. In 1778, the building was reconstructed and furnished with a conductor; and, according to Lichtenberg, up to 1783—that is to say, during the space of five years—the steeple had been struck only once, and this stroke had fallen upon the metallic point without producing any damage. For two or three years after its erection, the Church of S. Michael, in Charlestown, had been frequently damaged by lightning; a conductor was attached to it, and during the following fourteen years it had not been injured. The steeple of S. Mark's, in Venice, has a height of 340ft., and was frequently struck by lightning until a proper lightning rod was applied to it, since which time it has not been injured. These facts leave no room for doubt in regard to the great value of lightning rods.

The Best Form for the Rod.—If we examine the rods ordinarily found in market, and puffed by those who have invented them, we shall find that, instead of being solid bars of a square, round, or merely flattened form, they are tubes, twisted ribbons, or bars whose cross section has the form of a star. And if we ask why these complicated and expensive forms have been adopted, we shall be told that it is for the purpose of obtaining the greatest amount of surface with the least amount of metal, and this is done because electricity always resides on the surface. Those who reason in this way, however, prove clearly that they have never studied the subject, else they would be aware of the fact that while static electricity, as it is called—that is, electricity at rest—always disposes itself on the surface of bodies charged with it, electricity in motion pervades the entire substance of the bar through which it passes, and consequently the power of such a bar to convey electricity is measured by the quantity of metal that it contains, and not by the extent of surface that it presents. Pouillet showed this in a very clear and decisive manner. He measured the conducting power of a fine wire of cylindrical form—the form that presents the least possible surface in proportion to its cubic contents—and then, having flattened and annealed it, he tested it again. Its surface was enormously increased, but its power to conduct electricity was lessened rather than otherwise; this diminution being probably due to the fact that the wire was increased in length, and, consequently, its cross section was somewhat diminished. An experiment, equally decisive and perhaps somewhat more easily performed, is at the command of every one who has access to a small electrical machine and a two-quart Leyden jar. Take a fine gold wire, say the 50th part of an inch in diameter. This wire will present nearly the same surface as a ribbon of metal the 32nd part of an inch wide. The wire will carry off, without being injured, any charge that can be imparted to the jar. If, however, we pass the charge through a strip of gold leaf having several times the surface of the wire, it will be completely burned up and dissipated.

Arrangement of the Rod.—It is very obvious that the most perfect, though not the most economical, arrangement would be to cover the entire building with a sheet of metal. Then it would be impossible for the lightning to strike any point without falling upon a good conductor. But such an arrangement being obviously inadmissible, we must so arrange matters that the most exposed points shall be the conductor and its connections. The French Academy recommended the use of rods elevated nine to twelve feet above the building, and, after a good deal of experiment and observation, came to the conclusion that a rod was capable of protecting efficiently a space covered by a radius equal to twice the height of the rod above the most elevated part of the building. For ourselves a very careful examination of the conditions which arise during a thunderstorm leads us to place no confidence whatever in elevated rods, and to depend wholly upon so arranging the conductor that every part of the building shall be protected. It is obvious that the rod should be carried from the roof to the ground by the shortest possible way. Some have even recommended that it be carried down the chimney—a plan in which there is nothing objectionable, provided it happen to be the most convenient.

Attaching Lightning Rods to Buildings.—It is a very prevalent opinion that lightning rods should be carefully insulated from the buildings to which they are attached, and hence most rods are made to pass through glass tubes or insulators, the avowed object being to prevent the electricity from passing into the building. The extreme worthlessness of such arrangements ought to be obvious to any person whoever observed a flash of lightning. The discharge from a powerful Rhumkorff coil will pierce through five inches of solid glass, so that, if a lightning rod were entirely cased in a glass tube, an artificial flash of lightning can be produced which will pass through it as easily as a spark from one of the old machines would pierce a card! And if such a result can with safety be produced by artificial means, in a room filled with people, what would be the limit to the effects produced by natural means where thousands of acres of cloud surface are engaged? Insulators do very well to talk about, but as a security against Heaven's artillery they are powerless. Lightning rods should be connected with all large masses of metal which may exist in or upon the house, such as metallic roofs, tin or iron gutters or pipes, iron railings, &c. In the second place, the rod should be attached to the house in the neatest and least obtrusive method possible. If the rod be flat, it may be pierced with small holes and tacked directly to the building; but a better way, both for round, square, and flat rods, is to employ properly-shaped staples of stout wire. These staples may be driven into the studding of wooden houses or into the joints of brick walls, and, when properly painted, will not present an unsightly appearance.

Termination in the Ground.—Upon the perfection of the ground termination mainly depends the value of the lightning rod. If this be defective, no other good features can possibly make up for it. And yet, so little is it understood, that a careful examination of a very large number of rods leads us to believe that fully one-half the lightning rods in existence are defective in this respect, and, consequently, furnish but an insufficient protection. Iron conducts better than water, but water conducts better than dry earth. And just as we are able, by increasing its size, to make an iron rod conduct as freely as a copper one, so, by increasing the volume of water or soil employed to carry off the electricity, we can make it almost as efficient as the metallic conductor. These facts lead us to the following conclusions: (1) The end of the rod ought to be made to terminate in a layer of soil that is permanently wet; and (2) the end of the rod ought to expose to this soil as large a surface as possible. Permanently moist earth is to be attained only at considerable depths—say at the level of the water in the wells in the vicinity. Unless we reach this point, we can never be sure that our rod does not terminate in dry or but slightly moist soil; consequently no effort should be spared in sinking the rod to a sufficient depth. This is most easily accomplished at the time when the foundations are laid; and we would advise all builders to sink the lightning-rod termination when they sink the foundation. A short portion of the stem may be allowed to rise above the ground, and the conductor may be arranged and attached at a subsequent period. It is a common practice among lightning-rod men to form the earth termination by simply driving a crow-bar into the earth, and inserting the end of the rod in the hole thus formed. No reliance can be placed on an earth connection made in this manner. The crow-bar may have been driven into perfectly dry sand; and, in any event, the amount of surface exposed by the rod, and the consequent section of earth brought into action, is altogether too small.

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SANITARY SCIENCE AT THE BRITISH MEDICAL ASSOCIATION.

ON Thursday week, at the annual congress of the British Medical Association, held this year at Birmingham, Mr. T. J. Dyke, F.R.C.S., read a paper on "The Downward Intermittent Filtration of Sewage, as now carried on at the filtering areas at Merthyr Tydfil." After epitomising the part of the report of the Rivers Pollution Commission which treats of the clarification of sewage by filtration through certain kinds of soil, Mr. Dyke explained the details of the filtering process now carried on at Merthyr Tydfil. He also related the chemical, pecuniary, and general results, and then laid before the section the following propositions, as conveying his notions of a perfect system for the disposal and utilisation of excreta:—1. In order to diminish and limit to the smallest possible degree the chemical action which results when human or animal excretions are dissolved in water, the transmission and delivery of the sewage water on the land prepared for its reception should be effected in the shortest possible time. By means of the system of sewers and drains planned and formed by the Town Surveyor, the time occupied by the water in passing from the furthest point (five miles) of the system to the filtering areas does not exceed two hours. 2. The sewage water should be delivered on the land in such a state that the rootlets of plants can at once absorb and assimilate it. In our botanical studies, you will remember that we were taught that each rootlet of a plant, formed of cellular tissue, was closed at its extremity; that is, was covered as the papilæ of the tongue are by mucous membrane, or as the end of the finger is covered by the skin. We were also taught that the fluid on which plants live was absorbed through the substance of that covering tissue, hence that it was only that which was dissolved in water that the rootlet could take up. 3. I hold that no attempt should be made to precipitate from the sewage water any of the fertilising materials it holds in solution; for as sewage water does not hold in solution more of these fertilising matters than the earth can store, or the rootlets of the plant absorb, so to precipitate therefrom any of the dissolved matter is a waste of the fertilising material. 4. All insoluble matters floating in the stream should be removed by mechanical means. 5. All fertilising matters, as yet undissolved, suspended in the stream, should be removed by proper filters, and then treated by such chemical and mechanical means as may tend to render them soluble. 6. The sewage water thus freed from insoluble matters, and from soluble matters as yet undissolved, being passed on to lands prepared according to the principles suggested by Dr. Edward Frankland, and carried out according to the scheme of Mr. J. Bailey Denton, should so pass on to, through, and out of the soil, as to leave no scum on the surface of the soil, nor any polluting substance in the effluent water. From these propositions you will understand that I hold that the addition of lime, alumina, or any other chemical to the sewage, with the view of causing precipitation, is wrong in principle, and for these reasons—to precipitate, as I have already said, from solution in the sewage water that which we need for fertilisation, is a waste, and, therefore, an error; next, the precipitation of these soluble matters increases the sewage slush, and renders necessary the formation, at a great cost, of tanks for the reception of the deposit; lastly, in order to diminish the nuisance these tanks would otherwise occasion, it is necessary to add deodorants to the precipitating matters. Most of these deodorants virtually destroy the fertilising property of the deposit. By carefully straining all extraneous insoluble matters from the sewage stream; by filtering all undissolved, but yet soluble, matters therefrom; by treating these undissolved fertilising matters separately, by means calculated to promote their solubility; by these processes a sewage water should be obtained which may safely be passed on to land properly prepared.

In the discussion which ensued, Mr. de Renzy mentioned that at Delhi all the liquid sewage was deposited upon the land on which the city was built, and that it found its way into the wells, the water of which, though bad, was deemed by the people very good. It was a striking illustration of the purifying effect of the soil.—Dr. A. Hill quoted statistics showing that the results in purification obtained by intermittent filtration at the Birmingham sewage farm were much the same as those at Merthyr Tydfil.—Alderman Avery, who was invited to speak, disagreed with Mr. Dyke as to the advisability of using precipitants before placing the sewage upon the land to be filtered. He regarded it as necessary, in order to render the sewage more fluid and prevent the land getting choked; and he knew of no works where lime or some precipitant was not used.—Mr. Dyke maintained that it was wrong to take from the fluid sewage that which it had dissolved, and stated that it was intended to discontinue the use of lime at Merthyr.

Mr. de Renzy, Surgeon-Major of the Indian Army, read a paper on "Sanitary Improvement in India." He described the imperfect sanitary arrangements of the cities of the Punjaub, the consequently high death rates from pestilence, and the aversion of the native people to all improvement. He also related what had been done by the provision of proper barracks and in other ways to promote the health of the British troops stationed in the country.

Dr. Andrew Fergus, of Glasgow, read a paper on "Deranged Soil-pipes as a Cause of Diphtheria, Typhoid, and other Diseases." He exhibited several specimens of decayed leaden pipes which had connected water-closets with the sewers in houses where he had treated cases of diphtheria and typhus. The horizontally-placed pipes were decayed only on the upper side, and in a manner clearly showing that it was caused by gases evolved from decomposing excretal manner. The lower half of the pipes had been protected from decay by the contact of the liquid and the soil. This kind of decay was frequently overlooked by plumbers in examining whether the drainage of a house was all right, as they only examined the under sides of the pipes to see if there was any fluid leakage. In all cases where he had attended recurring cases of diphtheria or typhoid in a family, he had invariably found it accompanied by the escape into the house of sewer gas, either through pipes decayed as he had described, or in some other way. He was of opinion that an average leaden pipe, unventilated, would decay in about twelve years, but if ventilated the time was about twenty-one years.—In the discussion which followed the reading of the paper it was generally agreed that the diseases in question were caused by sewer gas, but that Dr. Fergus had pointed out a not generally known mode in which such gas found its way into houses.

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THE SHEFFIELD PERMANENT BUILDING SOCIETY.

THE ninth annual meeting of this Society was held on Monday. The secretary read the report, which stated that it is a matter for congratulation that the Society has obtained a well-merited confidence in the town, as is evinced by the large amount of money which has been lent to it during the past year, viz., £15,100—a great portion of which has been borrowed at 1½ per cent. interest, and loans to a much larger amount might have been procured could they have been profitably disposed of. The statement of accounts showed that the total receipts for the year had been £26,962 19s. 1d., of which £7,168 7s. 7d. had been received in contributions. There is at present owing to the Society on mortgage £50,591 3s. 8d., but the most satisfactory feature in the accounts is that there is a balance of £3,830 8s. 11d. available for bonus dividends and for a reserve fund.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT SOUTHAMPTON.

[From our own Reporter.]

(*Continued from p.* 100.)

FOURTH DAY, MONDAY, AUGUST 5.

THE section devoted to Antiquities met at 10 a.m. on Monday week, in the lecture hall of the Hartley Institution, Sir E. Smirke, M.A., in the chair. The Chairman gave a very interesting account of the charters and other documents and MSS. belonging to the Corporation and relating to the history of the town, at the conclusion of which,

The Rev. J. G. Joyce gave a lecture on the Roman remains at

SILCHESTER.

Mr. Joyce said that Silchester was known amongst ancient writers under two distinct names, viz., Caersegontiaci and Calleva Atrebatum. Having shown that Calleva and Silchester were identical, Mr. Joyce proceeded to show the important part which the Atrebates played in the early history of England. Commeus, their chief, was the very man with whom the whole of the plans and details of the invasion of England were discussed by Cæsar. Calleva was forty-four miles from London. The remains at Silchester did not show a vestige of British occupation—the whole of the remains were purely Roman. No doubt the place became a post of the Romans very soon after the conquest of Britain. The Romans took and fortified the British earthworks of the Segontiaci, and the town within the walls was in shape an irregular figure of nine sides. This wall was remarkable as having no towers. The fosse was 100ft. across, and its depth at present was 12ft. The length of the whole circuit of the wall was about a mile and a half. The wall was built in bonding courses of very heavy flat stones, alternating with courses of flints from 2ft. to 3ft. thick, laid very irregularly in herring-bone fashion. The flints were grouted, and the wall was so homogenous that where pieces had fallen down they had not broken in pieces, but remained whole, like boulders of rock. The thickness of the wall was about 9ft. It was stated by some writers to be 13ft., but Mr. Joyce's impression was that they had only measured the wall at certain places, as, for instance, at the south gate, where a portion of the wall of a greater thickness remained. It had often been asked whether the wall had been faced. He did not think so, for he had never met with any traces of it. What had given rise to this surmise was probably the fact that where the bonding-courses had been of very flat stones, the surface stones, when removed, had exposed a piece of flat mortar, having the appearance of a facing of mortar, but being, in reality, only the filling-up of a joint. The city had four principal gates, north, south, east, and west. These gates corresponded with the ends of the great roads running out north and south, and due east and west. Now the plans of Silchester which were to be found engraved in most books upon the subject, though in many respects very accurate, all showed the streets of the town askew, from the desire of the authors to bring the great road passing from east to west straight through from one gate to another. However, when the Ordnance Survey of the place was made, within the last three months, it was found that the projection of the Roman road struck the centre of the farm-yard, and on an excavation being made there, the east gate, with a double guard chamber, was found. The gate which best showed the construction of the walls was the one on the north, where the walls were higher, and where the gate curved inwards. Mr. Joyce then proceeded to detail the history of the excavations which he had, by the munificence of the Duke of Wellington, made within the walls. First of all he discovered a house, the plan of which had been engraved in the *Archæologia*. The general form of this house was such as one would expect to find in a Roman building of the kind—*i.e.*, a quadrangle in the centre, with an ambulatory on three of its sides; on the fourth side, facing the west, were the living rooms of the house. Two of these rooms were warmed by hypocausts. In a cavity sunk into the ground he had found the remains of a Roman strong-box, and the lock, handle, and key of the box were exhibited. The box was about 4ft. 6in. by 3ft. 6in. Another and a much larger house had been discovered, possessing many features of extraordinary interest. This house presented a series of walls intersecting each other, and apparently cutting the plan up into very small spaces, but a careful study of the house had made it perfectly clear that it was an altered structure, additions having been continually made, and the lines of the new rooms and buildings obtruding upon and overlapping those of the older portion. This house was probably the official residence of some one connected with the administration of the place. There was a rectangular space in the centre, surrounded by the usual ambulatories. There remained a very curious hypocaust, and another one, less peculiar, served to warm the triclinium, or dining-room. The Forum was one of the most remarkable Roman buildings in England. Its greatest length was 338ft., and its breadth was 276ft. These dimensions comprised two distinct edifices—the forum and the basilica. The forum had ambulatories attached to it inside and outside, and between the two ambulatories were shops, offices, and departments. From the remains found in each of the shops, &c., as coins, steelyard hooks, oyster-shells, Mr. Joyce proceeded to indicate the money-changers', butchers', and fishmongers' shops, &c. There were two rooms with semi-circular apses or ends, which were clearly used for tribunals or other administrative departments. The basilica was 276ft. long, and its general dimensions very closely resembled those mentioned by Vitruvius for a double basilica. There was no trace of any *septum* or division wall in the centre, although it was known that tribunals sat at each end. Having given a great many interesting details relating to these remains, Mr. Joyce concluded by pointing out the striking similarity between the plan of this forum and that of the Forum of Trojan, made by Canina. Both were probably of about the same date.

The Bishop of Winchester then delivered a short address on

THE VALUE OF ANTIQUARIAN PURSUITS.

Many people, he said, when an antiquary was coming to them, expected something amusing, and sometimes something rather absurd; but there was a far deeper side to archæology, which was stated, perhaps as beautifully as language could state it, by Lord Bacon in his book on "The Advancement of Learning." He said, "Antiquities are history defaced, or some remnant of history which has casually escaped the shipwreck of time." This was a beautiful idea in itself. Lord Bacon then went on to speak of what constituted the work of the true antiquary, and then he set a deep view of the whole of their pursuits before them. Returning to his old idea of the shipwreck of time, he spoke of antiquarians as persons who "by an exact and scrupulous diligence and observation, out of monuments, names, words, proverbs, traditions, private records and evidences, fragments of stone, and the like, do save and recover something from the wreck and deluge of time" (applause). He (the Bishop) did not quite agree with Bacon that it was history defaced. It was more especially the establishing of the remaining facts out of which history had to be formed, because history itself, as they commonly understood it, was far nearer theory about facts than a mere relation of the facts themselves. Such a pursuit as they were engaged in was full of every advantage, especially to a people in a high state of civilisation, and that, he thought, every reasonable man would see in a moment. There could be no future to a people about whom there had been no past; the future developed itself just as it did in life in the world around. The future carried it out of the past. Dead vegetable matter made the humus, into that the roots of the living tree were struck, and because there had been vegetation in the past there was vegetation in the future. And so it was with regard to the higher life of a nation. Unless there was a past to which it could refer, there could not be in it any high sense of its own mission in the world. New peoples were predatory—they came, as the Goths of old, to plunder and overrun countries which had a past and extinguish them, and as they acquired for themselves a past they began to develop a future out of the past, and so that which had led them to love and venerate the past did, in fact, give them the best standing point for helping in the present to make provision for the coming of the future. He did not want to bring the old times back again, but they would understand the present around them far better if they could trace the present back into the past, see what it arose out of, what it had been the development of, and what it contained to serve for the future before them. There was nothing which so tended to keep the mind of men from rash experiments, from those things which destroyed nations altogether, by the sudden imagination crossing the mind that some very great result might be obtained by some entire subversion of everything. There was nothing on the one side that more guarded a people against that than by having a veneration for the past, and nothing more truly directed those shapings of the present, which every reasonable man knew he had to give way to, than the being able in the new shaping to have before him the old out of which he was going to shape it, so that his shaping might only carry out more completely the purposes for that which he was now altering began to exist. They might see all he had ventured to suggest when they looked round the grand old Cathedral they were to visit that day. With it grew up the life of England, out of the remains which were left at the Saxon invasion, which extinguised the earlier Christianity. Out of the restoration of the Saxon element as it became historic, developing itself through a series of great priests and princes, the wonderful building had been erected.

On the conclusion of the Bishop's address at the Hartley Institution, the train was taken to

WINCHESTER,

where the party, under the guidance of Mr. J. H. Parker, first inspected the building now known as the County Hall. Mr. Parker said that this building had a well-authenticated history, which was found in the public records. It was built in the first twenty or thirty years of Henry III.'s time, and the main construction was of the early part of the thirteenth century. The present windows were insertions of the time of Edward I. The hall was a very fine hall for its period, corresponding with Westminster Hall. It is at present and has long been used for courts of justice. To serve this purpose, the hall was cut up into three portions by screens extending up to the roof. The central portion forms a wide open space, from which the courts, which are at either end, are approached. Mr. Parker hoped that these partitions would soon be cleared away, and the lath and plaster removed from the roof, so that the hall in its integrity might be exposed to view. The building formerly served as the banqueting-hall of the King's Castle of Winchester. Mr. Parker observed that the building showed to perfection the beautiful mouldings to the arches and the coupled shafts, for which the Early English style was so celebrated. In short, the building was one of the finest Early English halls to be found anywhere. He had at one time stated that the present windows were of Henry III.'s time, but subsequent and more careful investigation had shown that they were later insertions. On the interior, in fact, were to be clearly seen the outlines of the original lancet windows. The present state of the middle part of the hall was pointed out as giving some idea of the roof. Having visited the muniment-room belonging to the Corporation, and which is located over the old west gate of the city, the visitors went on to

ST. CROSS.

Here luncheon was provided in "Hundred Men's Hall," by the Master of the Hospital, and the party then proceeded to inspect the church, under the able guidance of Mr. J. H. Parker, C.B., who said that the church had been so often described that it was quite unnecessary for him to go very fully into the subject. In the Institute's Winchester volume a good account was published twenty years ago by Mr. Freeman. It was begun early in the twelfth century by Henry de Blois, Bishop of Winchester, and went on slowly for half a century. When half completed the Decorated part of the work was altered. The arches of the nave could not be earlier than the latter part of the eleventh or the beginning of the twelfth century. The way in which the shafts were corbelled in the choir indicated that woodwork went along below them. There were chantry chapels on both sides of the aisles, one, however, being of much earlier date than the other. Coming to the important question of painted decoration, Mr. Parker said that the building had always been intended to be painted, but how far the present colouring of the choir represented the original painting there was no evidence to show. It appeared to him that the present colouring [carried out under the direction of Mr. Butterfield] did not sufficiently bring out and emphasize the architectural forms of the choir—(hear, hear)—and the colours were, moreover, too brilliant—(hear)—although they would, no doubt, tone down in time and improve in appearance. The object of all the internal colour decoration of Mediæval times was always to give emphasis to the foliage, mouldings, and other parts of the building, but he did not think that the example they were then looking at was a very successful attempt. (Hear, hear.) He thought, however, that too much fault had been found with it. (No, no.) At any rate, its intention was good, and the colour was much better than whitewash. This remark of Mr. Parker's did not, apparently, convince his hearers, many of whom were loud in their complaints that the thing had been overdone, and some of them likened the work to imitations of harlequins' dresses and clowns' "motley." Mr. Parker having expressed the opinion that the carving of the screen on each side of the eastern end of the choir was not earlier than the time of Henry VIII., and that it was English work, pointed out one or two notable features in the transepts. One of the present windows in the north transept was formerly an opening into the infirmatorium, and through this opening the sick brethren were enabled to see the elevation of the Host. Outside the south transept there was a remarkable triplet arch connected with a doorway. The vaulting Mr. Parker said was remarkably fine Late Norman work. In one of the bays there were traces of there having formerly been a kind of buttery hatch, through which doles were passed. Proceeding outside the building, Mr. Parker pointed to the western doorway as containing the richest piece of tooth ornament he knew of anywhere. This doorway was of the time of Henry III., the rich window above being of the time of Edward III. Hundred Men's Hall was a very fine example of Early Perpendicular or Late Decorated work, the original roof appearing to be intact. The domestic buildings now occupied by the thirteen brethren are of the time of Edward VI., and they were especially commented upon by Mr. Parker as showing what chimneys ought to be. Chimneys were the great failure in all modern buildings (Hear, hear). This group of chimneys, Mr. Parker said, was quite unique. It may interest some of the readers of the Building News to know that one of the thirteen brethren of S. Cross Hospital (Brother King) was formerly a builder. He is at present eighty-five years of age, and we were told that he had taken great interest in the restoration of the church.

WINCHESTER COLLEGE.

The College was next visited, Mr. Lee, the warden, escorting the visitors over the buildings. The college brewhouse and slaughterhouse, running parallel with the street, were first pointed out. Passing through the outer gate and court, and through the principal gateway, the quadrangle was reached, and here Mr. Parker pointed out that very much of the work here corresponded with that at New College, Oxford. At the latter, however, the hall was at the east, while at Winchester it is at the west end of the chapel. Both buildings, as is well known, were erected by William of Wykeham, and they were both parts of the same foundation, Winchester being established as a preparatory school for New College. These buildings were the best and earliest specimens of purely collegiate establishments. Entering the chapel, Mr. Parker said that the great west wall dividing the chapel from the hall of course never had a window in it, but it was probably painted with a representation of the Doom, that being the usual place for the delineation of that subject. The Warden next related how the original stained glass in the east window had been misappropriated by a certain firm of artists in glass who were employed to restore it in 1825. Part of the glass was now in the South Kensington Museum. Proceeding outside the building the visitors inspected the tower (rebuilt in 1861) and the cloisters, which date from 1482. Mr. Lee, the Warden, said that of late the walls supporting the hall had fallen out of the perpendicular, and engineers and architects were now being consulted as to underpinning. The Library (originally an oratory, built about a quarter of a century after the date of the college foundation) having been visited, a peep at William of Wykeham's original schoolroom for seventy boys concluded the inspection of the college buildings.

WINCHESTER CATHEDRAL.

Proceeding to the north transept of the Cathedral, Mr. Parker said that Winchester Cathedral afforded one of the finest examples for architectural study anywhere; in fact, he did not know of an example in which they could more readily work out the whole history of English architecture, from the eleventh century downwards. No Saxon work remained in the building, which was commenced in the eleventh century in a style properly belonging to the twelfth century. The transept in which he was speaking showed the Early Norman work of the original building, and what made the building particularly interesting was that early and late Norman work could be compared from one point of view. A distinguishing characteristic of Norman masonry was its jointing. Early Norman work was wide or coarse in its joints, while Late Norman was close or fine-jointed. The triforium gallery here was unusually large, and the piers, triforium, and clerestory windows were peculiarly complete. Some of the present windows were insertions of the time of Edward II. Attention was directed to a rich chantry chapel on the east side, and in the retro-choir the Early English work of the roof was much admired. Mr. Parker thought that the choir was rebuilt at the same time. The Lady Chapel, in the Perpendicular style, contained some fine fan tracery vaulting—rather an early example, but very good. Mr. Parker pointed out that this work was peculiarly English, and was due to scientific construction. The French builders could not execute fan vaulting, and the whole of their vaulting was constructed in a much cheaper and rougher manner than was English work. Stones for vaulting in French work were merely cut the same as the stones for the walls, and wedged up with mortar; but in England every stone was cut to shape. Entering Bishop Lucy's Early English Chapel at the extreme east end, and noticing the bay added in the time of Henry VII. (it was supposed for the purpose of being able to say that the Cathedral was the longest in England), the remains of wall-painting, illustrative of Scriptural and fabulous legends of the Virgin, were examined with great interest. Mr. Parker directed attention to the beautiful and skilful manner in which William of Wykeham had, as it were, thrown a veil over the original Norman work of the building, giving it a richer and lighter character. But for the Norman work peeping out here and there, one would suppose that it was the work of but one period. The choir stallwork was very fine and rich, and although somewhat earlier than Wykeham's work, harmonised perfectly with the rest of the building. Mr. Parker having remarked that William of Wykeham was the inventor of the Perpendicular style, the Rev. J. G. Joyce said he considered that William de Edyngton was the inventor. Mr. Parker replied that Edyngton's work was Transitional, but that Wykeham's work was, in his opinion, the earliest decided Perpendicular, and if a style could not be fairly attributed to one particular individual, still, Wykeham, who was a great architectural genius and builder, worked out more thoroughly than anyone else the Perpendicular style. The altar-screen, with its rich canopy-work, was very beautiful and well-preserved, all the statues being absent, however. Archdeacon Jacob asked whether this screen could be removed without endangering the walls. Mr. Parker replied that that was a question for the constructor rather than the archæologist. Sir Stafford Cary thought that if the screen were removed it would greatly improve the interior of the building. This view was apparently not shared by the majority of the visitors, Mr. Parker replying that he should be sorry to disturb the screen himself. The crypt was next visited, as showing the original plan of the church, with the Norman apse of the eleventh century. The floor of the crypt was at present 5ft. or 6ft. above the original level. Ascending to the nave, Mr. Parker, in reference to the smallness of the triforium, said it evidently arose from that feature having been taken out of the upper part of the Norman arches, as was shown by the bays opposite the choir steps, where the shafts belonging to the rood loft still remained.

Having still further examined the different portions of the building, the excursionists returned to Southampton at 7 o'clock.

FIFTH DAY.—TUESDAY, AUGUST 6.

On Tuesday an ordinary train left Southampton at 8.45, arriving at Basingstoke at 9.30. From Basingstoke a special train on the Great Western Railway conveyed the party to a point near Silchester. Carriages were in waiting, and the site having been reached, the walls and gates were inspected, under the guidance of the Rev. J. G. Joyce. During this part of the proceedings the rain was very heavy. Luncheon having been served in a tent, the houses and forum were inspected, Mr. Joyce's remarks necessarily being to a great extent a repetition of those contained in his lecture at Southampton, and of which we give on a preceding page a brief summary. At 3 p.m. the party left for

BASINGSTOKE.

The ruins of the Holy Ghost Chapel, close to the railroad, were first visited, under the guidance of Dr. Miller, the vicar of Basingstoke. Dr. Miller said that the building was erected early in the reign of Henry VIII., and was remarkable—almost unique—in its dedication. It was built as a free chapel for a brotherhood without vows, who were to be engaged in work of a distinctively educational character. The chapel was most beautifully finished, the materials being exquisite, and the details of singular delicacy. Indeed, the building was so late that some of the details were quite Renaissance in character. It was founded in 1520, and was dissolved by Act of Parliament in the reign of Edward VI. The townsmen having petitioned for its revival, it was revived and restored in the reign of Queen Mary, but in the reign of Elizabeth the funds were diverted and applied to the foundation of the School of the Holy Ghost, which now is known as the Queen's Free Grammar School of Basingstoke. The chapel was dismantled by the Parliamentarians. Until within twenty years ago the school was actually held in the building at the rear of the chapel, which was certainly very much earlier in date than the latter.

Basingstoke parish church, dedicated to S. Michael and All Angels, was then visited. The dedication was rather remarkable, as it was generally found only in connection with buildings situated on very high ground, but it might be accounted for from the fact that the church was connected with S. Michael's Mount, in Normandy. At first sight it would hardly be supposed that the nave was so very late as it was (*temp.* Henry VIII). The windows showed plainly that the building was debased or Flamboyant. The chancel was about a century earlier than the nave. There was reason to believe that the chapel now containing the organ was the chapel of Walter de Merton, who founded Merton College, and who built in Basingstoke a lazar house for the inmates of the college. Some interesting fragments of ancient stained glass, inserted in the eest window of the north aisle, were next examined with much curiosity, as was also a triptych, painted by a Flemish master, of about the year 1480. The fine modern stained glass window at the east end, by Lavers & Barraud, was remarked upon by many of the visitors as being particularly excellent in design and execution.

The visitors having been entertained by the Mayor and Corporation at the Town Hall, carriages were taken to Old Basing, where the church, dedicated to S. Mary, and chiefly Perpendicular in character, was just glanced at, and a flying visit was paid to the remains of Basing House, formerly the abode of the Marquis of Winchester, by whom it was defended against the Parliamentarians, and when stormed, was utterly destroyed. The most notable remains are those of the *enceinte* wall, and the entrance gates, bearing shields of the Paulet arms. The visit to Old Basing, however, was so hurried as to be hardly worth the time and trouble. As it was, several members of the party were left behind, being unable to catch the train from Basingstoke to Southampton.

SIXTH DAY.—WEDNESDAY, AUGUST 7.

The Historical Section met in the Lecture Hall of the Hartley Institution at half-past nine, when the following papers were read: "On Roman and British Pottery found in the New Forest," by the Rev. J. P. Bartlett; "On the Alien Priories of the Isle of Wight," by the Rev. Edmund Venables, Precentor of Lincoln; and a memoir on "Monastic Decorated Tiles found in the South of Hampshire," by Mr. B. W. Greenfield.

At 1 o'clock a special steamer left the Royal Pier for Cowes, Isle of Wight, whence the excursionists proceeded by rail to

NEWPORT.

Here they inspected a temporary museum, very rich in Anglo-Saxon relics and other Isle of Wight antiquities. The church here, dedicated to S. Thomas, was then visited. The building is modern Perpendicular, having been built in 1854 from the designs of Mr. W. Daukes. A very elaborately carved oak Renaissance pulpit was pointed out by the vicar. It was executed by Joseph Carver in the latter half of the seventeenth century (1676), and represents in panels the seven liberal sciences, the four cardinal virtues, and the three graces. A monument to the Princess Elizabeth, daughter of Charles I., was also pointed out. The font is of the time of James I.

CARISBROOKE.

The visitors next proceeded by carriages to Carisbrooke, where they inspected the remains of the Roman villa, which were discovered in 1859 by Mr. William Spickernell in the vicarage garden. Mr. J. H. Parker directed attention to the principal points of interest, which include a very fine tesselated pavement of the guilloche pattern, dating from about the third century. The remains of the old bath and its furnace are very perfect. Carisbrooke Church was next visited, and a Puritan pulpit, dated 1658, attracted much attention. The church originally formed part of the Priory of Carisbrooke, founded by William Fitz-Osborne, son-in-law of William the Conqueror. Mr. Parker said that the church contained the remains of what had been a very fine Transitional Norman building, the date being about 1180. The pier arches of the nave remained perfect. The chancel had been destroyed, but whether by the Puritans or at the time of the Dissolution was not clear, although Mr. Freeman's theory was that it was destroyed in Henry VIII.'s time. Outside could be seen traces of the chancel arch. The aisle was a later addition. At the west end there is a very fine Perpendicular tower of the time of Henry VI., with the buttresses built into the west end of the church. The tower arch is open; the lower part of the tower serves as an organ chamber. Traces are visible of what Mr. Parker considered must have been a western screen.

Carisbrooke Castle.—Carisbrooke is the site of a castle built and occupied by the Romans, and the earthworks were undoubtedly British. The place was formerly the seat of the Governor of the Island. The bowling-green, commonly called the "tilt yard," may have been an amphitheatre during the Roman occupation. Very curious and interesting is the deep castle well, said to have been made by King Stephen. Mr. G. T. Clark, who was to have described the castle, being unavoidably absent, Mr. J. H. Parker said he was not prepared to say much about the building. The keep and other portions were commonly spoken of and considered as Norman; but, although he had made careful examination of the keep, he had failed to find any Norman work. The keep was a very fine Edwardian structure. Proceeding to that part of the building now used as Militia stores, Mr. Parker pointed out the remains of what was apparently an Early English chapel. Among these remains was some arcading, *temp.* Henry III. This appeared to him to be the earliest part of the Castle. The outside of the keep appeared to him to be finer than the interior. As to the remains of the chapel just referred to, Mr. Burtt, Assistant Keeper of the Public Records, said that there were documents relating to repairs to the chapel of the Castle in the time of Henry III. Proceeding round the walls, the window whence King Charles escaped was pointed out by Mr. Kell, F.S.A., and a buttress adjoining was stated by Mr. Parker to be of the time of Henry III., *i.e.*, earlier than the rest of the keep. Passing out, Mr. Parker directed attention to the fine gateway, which was of the time of Edward III. This gateway has a very fine bold *machicoulis*, and the walls were pierced with a number of round holes, probably for small cannon or falconets; these, however, were of later date. The Tudor window immediately above the archway was an insertion.

The visitors then returned by carriages to Newport, where refreshments were kindly provided in the Town Hall by the Mayor. The train was then taken to Cowes, whence the excursionists returned by boat to Southampton, arriving at about 8 o'clock. At 9 o'clock there was a *conversazione* in the Museum of the Hartley Institution.

CONCLUDING MEETING

The concluding meeting was held yesterday (Thursday) week at the Hartley Institution, when it was announced that Exeter had been selected as the *locale* of next year's meeting. The general opinion is that the Southampton meeting has been an unusually successful and interesting one.

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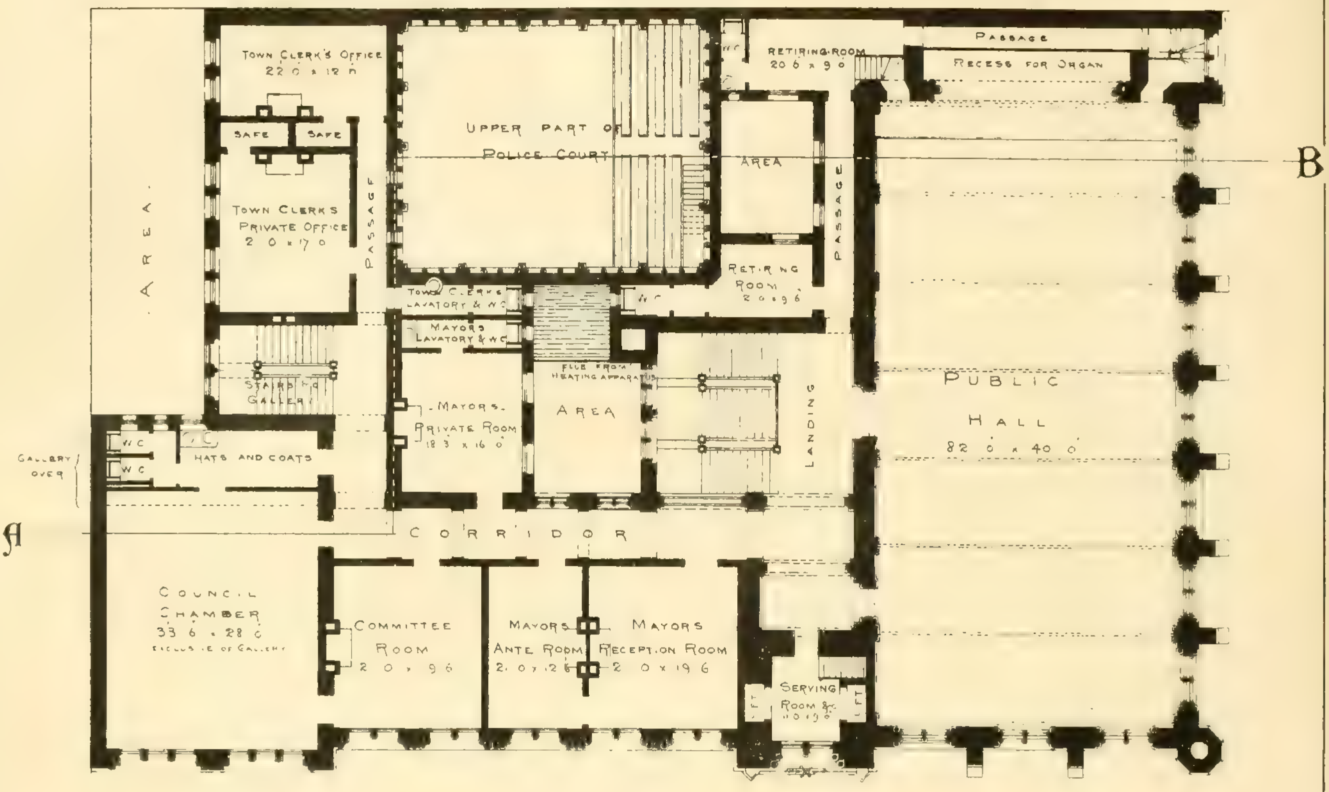
THE PORTLAND BREAKWATER.

THE Portland Breakwater, the last stone of which was laid by the Prince of Wales on Saturday, has been erected for the protection of vessels in the Portland Roads, under the superintendence of Sir John Coode. The structure has cost upwards of a million pounds, being almost entirely the work of convicts. The foundation-stone was laid on the 25th of July, 1849, by the late Prince Albert; thus the construction of the extensive works has occupied more than twenty-three years. From the island of Portland itself the structure extends some 3,500ft. in the direction of the north-east, then for about 5,000ft. stretching due northward across the bay, the break of the two parts occurring at the east end. Through the opening thus formed ships may pass into smooth water, and, favoured with a fair wind, proceed down channel. The gap is of sufficient width to allow two line-of-battle ships to pass out abreast. At the east-end of the breakwater stands a solid circular granite fort. The great North fort—the feature of the breakwater—is still more formidable. Its dimensions are 100ft. in height, 400ft. diameter at the base, and 200ft. at the summit, the solid stone structure standing in a depth of from 60ft. to 70ft. of rough sea-water. An idea of the magnitude of the undertaking may be gathered from the fact that the foundations of the granite columns consist of 140,000 tons of stone. The walls at the base consist of granite 4½ft. in thickness, and Portland stone 8ft., the former tapering at the summit to 4½ft., and the latter to 4ft. The fort has three stories, the basement being set apart entirely to reserve and expense magazines with shot and shell stores, while the two upper stories are casemated mortar batteries. The eastern portion of the works has a round parapet and sea-wall, and at the summit are roadways, divided into two platforms; one of which, on the inner side, next to the land, is 40ft. in breadth, and 12ft. above the level of the sea, while the other is 18ft. broad, and 28ft. above the sea, and rests on a series of arched recesses. A coal storehouse, in which 6,000 tons of fuel may be housed, stands on the land end.

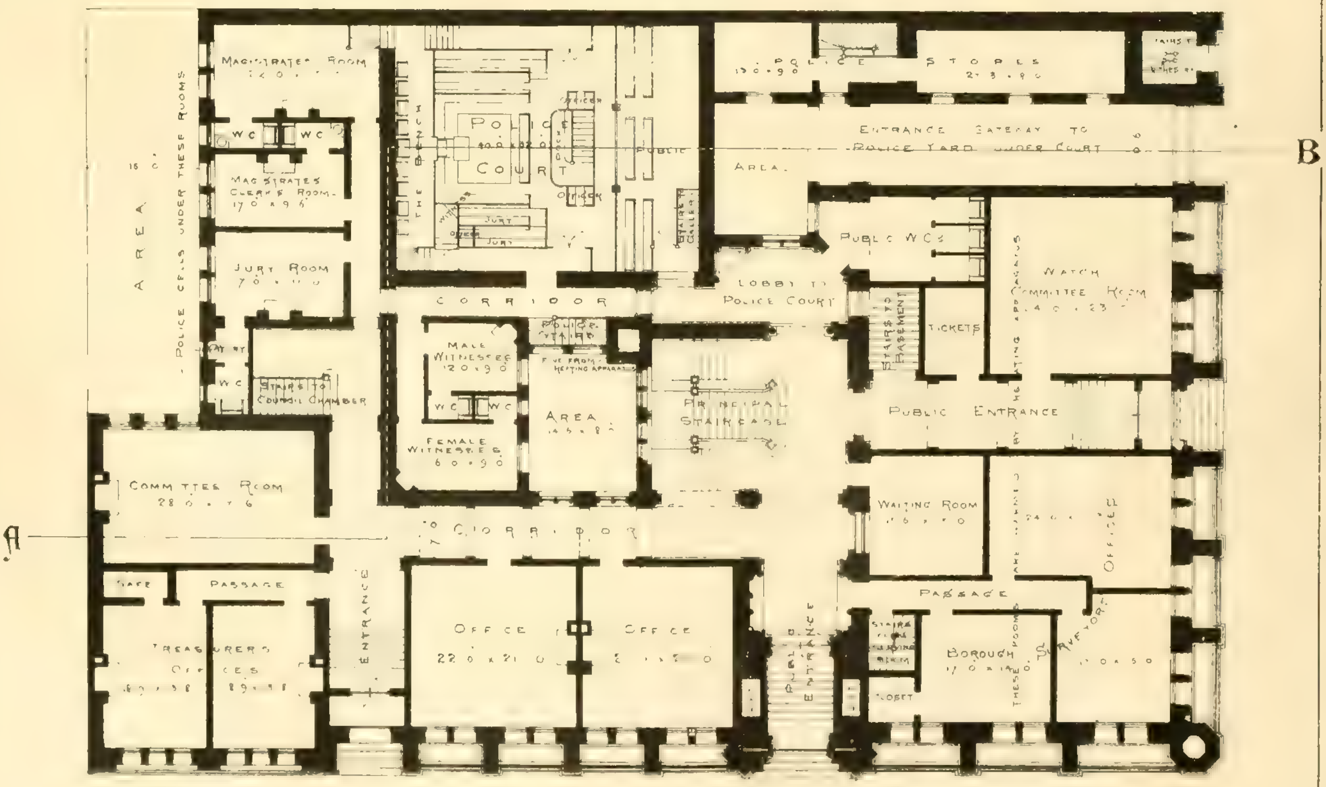
DESIGN FOR A TOWN HALL
FOR A COUNTRY TOWN

by Alfred Reading.
Architect.



FIRST FLOOR PLAN

SCALE OF FEET



GROUND PLAN

SCALE OF FEET

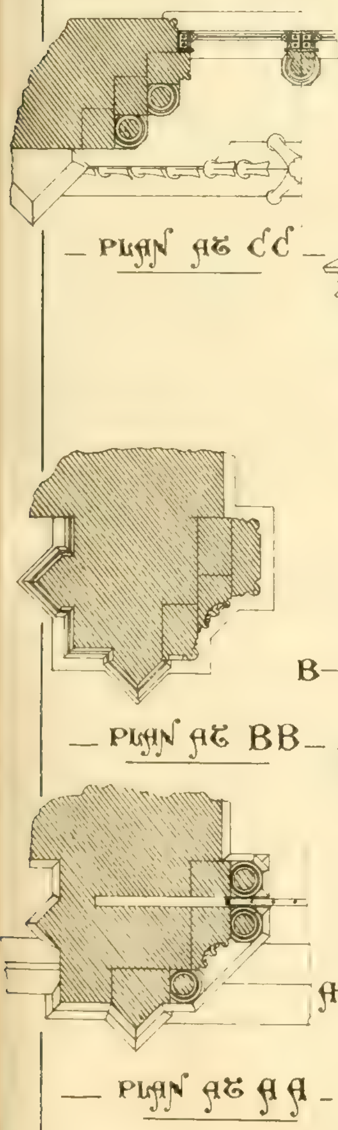
THE BUILDING NEWS, AUG^T. 16th 1872.

DESIGN FOR A TOWN HALL

FOR A COUNTRY TOWN

DETAIL OF ENTRANCE AND WINDOW OVER IN TOWER

by Alfred Reading, Architect.



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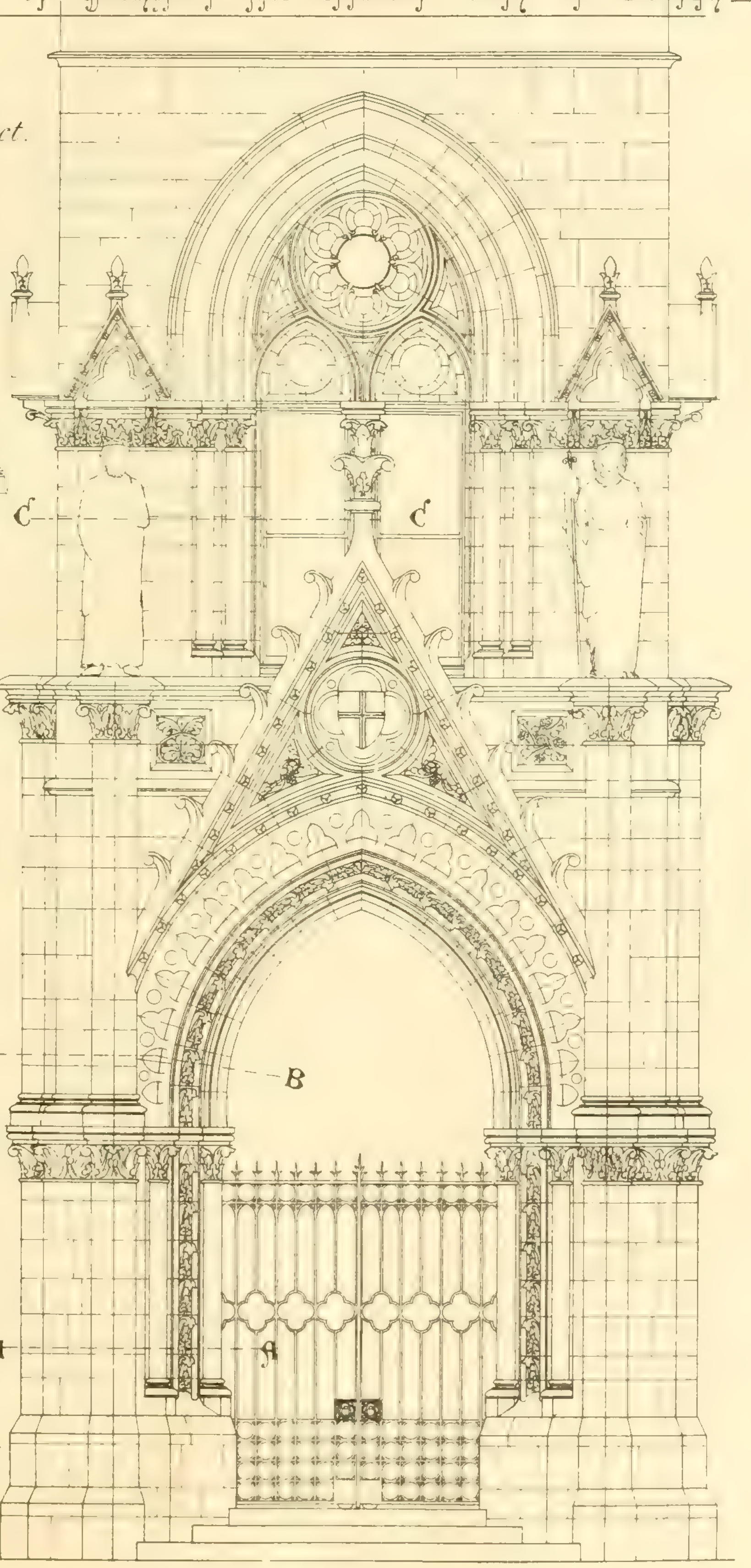
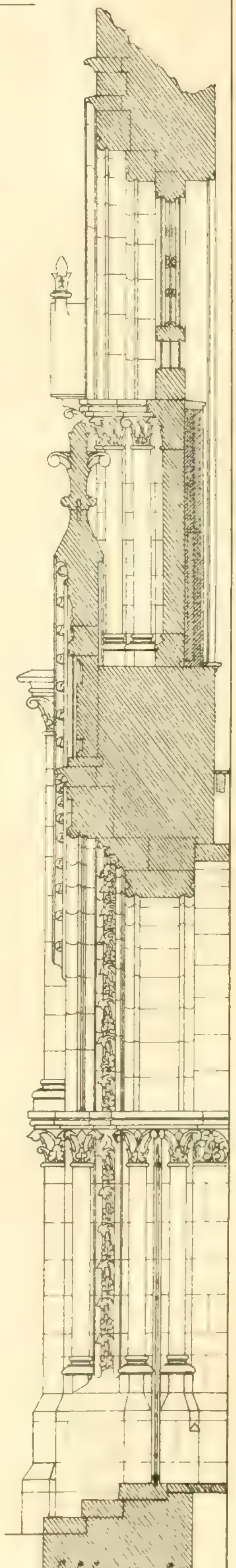


ELEVATION



SECTION

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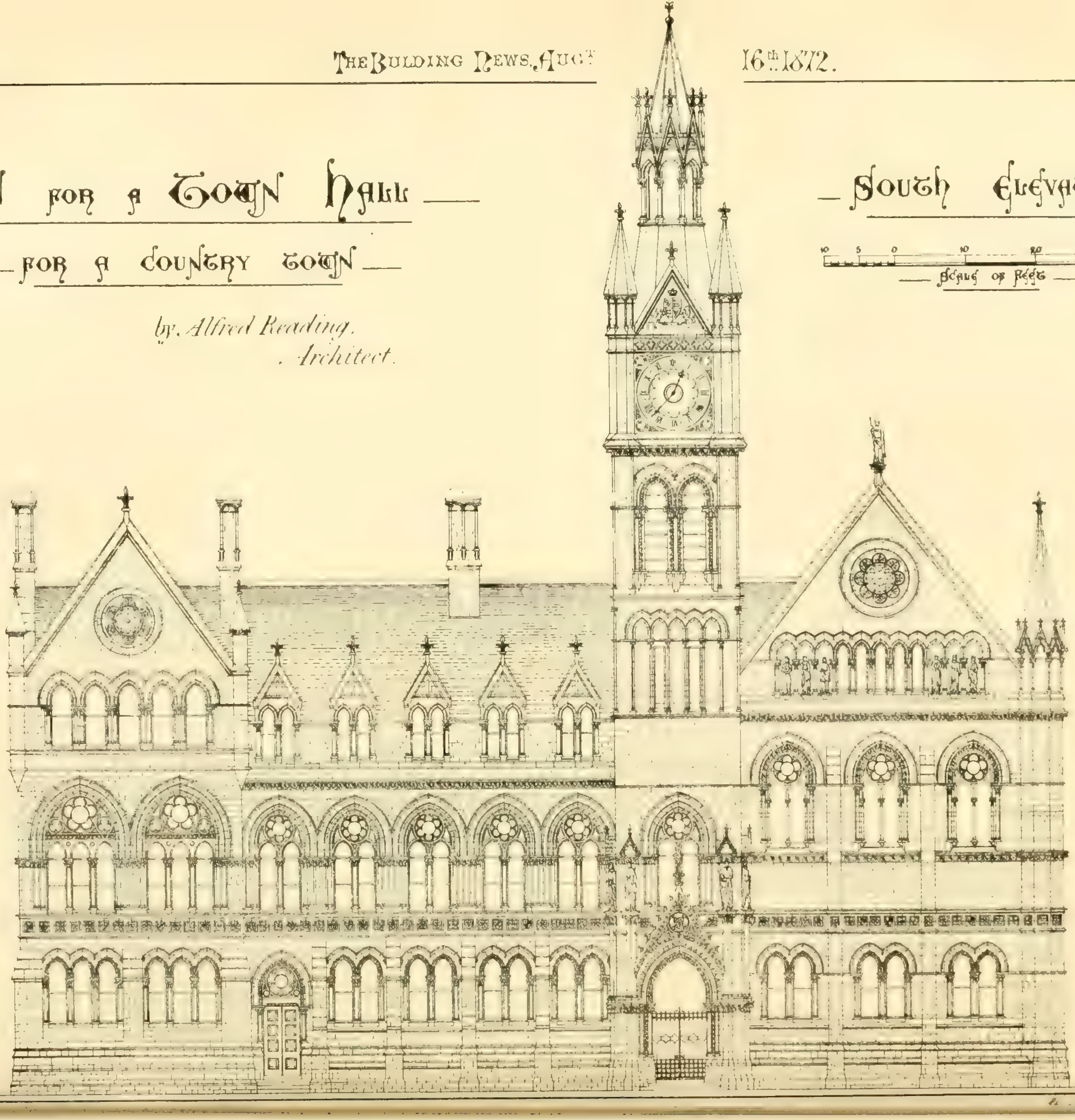
THE BUILDING NEWS, AUG.T 16th 1872.

— DESIGN FOR A TOWN HALL —

— FOR A COUNTRY TOWN —

by. Alfred Reading.
. Architect.

— SOUTH ELEVATION —



NOTES ON EARTHWORK—XIII.

MACHINERY is not much employed in England for excavating or removing earth in dry ground, except that for long leads locomotives are preferable to horses; leads, that is to say, of more than about two miles in length, which, however, seldom occur; and that steam cranes are used to raise earth excavated within limited spaces, and at considerable depths, where there would be no room for barrow roads or horse runs; but in excavating under water, and especially in removing obstructions in the beds of rivers, machinery is very largely employed, from a common windlass to raise a bag and spoon into a punt or barge on the smaller rivers to a powerful steam-engine to drive a chain of buckets on board a dredging vessel in larger rivers.

In bag and spoon work an iron ring of about 2ft. wide and 2ft. 6in. long, steeled at the front end, and flattened to a cutting edge, and having a bag of strong leather or canvas attached to it, is fixed by a socket to the end of a pole, which is guided by a man at one end of the barge, while a rope attached to the ring and taken to the other end of the barge is there passed round the barrel of a windlass. The pole being guided into an upright position at the side of the barge, the rope is wound upon, and the spoon dragged along the bottom until it arrives near the other end of the barge; the rope being now brought nearly into a vertical position, the winding is continued, and the bag raised above the surface, when its contents are turned into the barge. By another rope the bag and spoon are hauled back again to the other end of the barge, and the operation repeated. Soft ground may in this way be dredged at a cost of 8d. or 9d. per cubic yard, and gravel from 10d. to 1s.

Another plan is to moor two barges, one on each side of the river, and upon a chain passing from one to the other to place an iron dredging bucket. On one of the barges the chain is wound round a crab winch, worked by six men, and on the other barge the chain is wound round a common windlass, worked by two men. The bucket is dropped on to the bottom at the side of the barge containg the windlass, and drawn across by the crab winch and into the other barge by means of sloping planks, the bucket being again lowered and hauled across by the windlass in the opposite barge.

The articles which precede this one are based chiefly on the experience of the author of them, but this and those which may follow, on the contrary, are based chiefly on that of others. Where statements are made of things not within the personal knowledge of the author, the proper authorities are given.

It is stated in Mr. David Stevenson's "Canal and River Engineering," just published, that hand dredges, worked by from 7 to 12 men, cost from £230 to £390. They can work in a depth of about 16ft. of water, and can raise ordinary deposit at a cost of from 1s. 6d. to 2s. per ton. Mr. Stevenson says that the Clyde trustees employ the largest dredging fleet of any river trust in the kingdom, in maintaining and still deepening and widening the river to meet the ever increasing demands of the shipping trade. Mr. James Deas, engineer to the Clyde Navigation Trustees, supplies him with the information that last year 904,104 cubic yards, or 1,130,000 tons were dredged from that river, of which 689,560 cubic yards were carried out to sea in hopper barges, and 214,544 cubic yards were deposited on land by means of punts. Of the 904,104 cubic yards as much as 345,209 were dredged from the upper reaches of the river and its tributaries and from the deposit from the city sewers, and 558,895 cubic yards of new material were dredged, representing the increase in the capacity of the river called for by the increasing necessities of the shipping trade. The average cost of dredging and depositing was 9·41d. per cubic yard.

Loose gravel is the most favourable material to work in, but a powerful dredger will break up and raise indurated beds of gravel, clay, and boulders. Owing to the difference in power of the dredging machines employed on the Clyde, and the character of the material raised, the cost of dredging varies much. Last year, it is stated by Mr. Stevenson, the most powerful machine lifted 430,240 cubic yards of silt and sand in 2,420 hours, at a cost of 2·6d. per cubic yard, and this was deposited at a distance of 27 miles from Glasgow by steam hopper barges, at a cost of 5·46d. per cubic yard, making rather more than 8d. together. The buckets of this dredger are 3ft. 3in. × 2ft. 5in. × 1ft. 11in., and when working in sand can lift 190 cubic yards per hour. The greatest depth of water the machine can dredge in is 28ft.

On the other hand, another dredger working 2,605 hours lifted only 26,927 cubic yards of hard gravel and boulder clay, at a cost of 20·8d. per cubic yard, which was deposited on the alvens or bed of the river at a cost of 17·46d. per cubic yard, making together 3s. 2¼d. per cubic yard.

Another machine working, 1,832 hours, raised 122,664 cubic yards of silt, sand, and sewage deposit, at a cost of 5·67 per cubic yard. This was deposited on land at a cost of 16·40d. per cubic yard, making 1s. 10d. together.

Another machine, working 2,233 hours, excavated 65,160 cubic yards of silt, gravel, and sand, at a cost of 5·89d. per cubic yard, and it cost to deposit it on the alvens of the river 9·83d. per cubic yard, making together 1s. 3¾d.

The total quantity of deposit and new material dredged from the Clyde during 27 years has been 13,617,000 cubic yards, or upwards of 17 million tons. The dredging plant of the Clyde trustees consists of 6 steam dredgers, 14 steam hopper-barges, 1 tug steamer, 3 diving-bells, 270 punts, and numerous row-boats, the total value of which is £140,000. The wages of the crews, coal, and stores last year were fully £14,000, and the cost of repairs £10,775!

Mr. Murray supplies Mr. Stevenson with information on the cost of dredging in the river Wear, from which it appears that during 5 years the average cost was as follows:—

Raising and depositing at sea	1·528d.	per ton
Fuel	0·149	"
Labour in repairs	0·943	"
Materials in ditto	1·243	"
Total	3·863	"

There are two ways in which dredging is performed. One is to steam straight ahead longitudinally of the river, by which means parallel furrows are excavated in the bed, and the other is to traverse the river laterally by means of shore anchors and chains, and take a turn ahead each time of arriving at either side, whereby the whole width required to be excavated is done as the dredger proceeds.

In some cases the bottom is found to be too hard to be dredged until it has been loosened and broken up. At Newry Mr. Rennie blasted the bottom to a depth of 6ft. or 8ft. at low water, and removed the material by dredging, at a cost of from 4s. to 5s. per cubic yard. At the bar of the Erne, at Ballyshannon, Messrs. D. & T. Stevenson found large quantities of boulder stones, which were blasted and afterwards raised by dredgers worked by hand, at a cost of 10s. 6d. per cubic yard.

An account is given by Mr. George Edwards, in the Minutes of Proceedings of the Institution of Civil Engineers, of an extensive application of blasting for the improvement of the river Severn under the directions of the late Sir William Cubitt, from which it appears that a succession of marl beds, varying from 100 yards to half a mile, were found in the channel of the river, which proved so hard that, by dredging alone, no more than 50 or 60 tons could be raised per day, while the machinery of the dredges was constantly giving way. Attempts were first made to drive iron rods into the marl beds and to break it up, and a second attempt was made to loosen it by dragging across its surface an instrument like a strong plough, but these plans proving unsuccessful, it was determined to blast the whole surface to be operated on. The marl was very dense, weighing 146lb. per cubic foot, which is about one-third heavier than the average weight we gave (in a former number of this series of notes) of marl in its ordinary condition above water. At the Severn bore-holes were drilled, 6ft. apart each way, to the depth of 2ft. below the level of the bottom to be dredged out. The bores were made in the following manner, from floating rafts moored in the river:—Wrought-iron pipes 3½in. diameter, three-sixteenths of an inch thick, were driven a few inches into the marl. Through these pipes holes were bored, first with a 1½in. jumper, and then with an auger. The holes were bored 2ft. below the proposed bottom of the dredging, as it was expected that each shot would dislocate or break in pieces a mass of marl of a conical form, of which the bore-hole would be the centre, and its bottom the apex, so that the adjoining shots would leave between them a pyramidal piece of marl where the powder would have produced little or no effect. By carrying the shot-holes lower than the intended dredging, the apex only of this pyramid was left to be removed. The shots were fired with Bickford's fuse. The quantity of powder used was—for holes 4ft. deep 2lb., 4ft. 6in. deep 3lb., 5ft. deep 4lb. Not one in a hundred missed fire. The effect of a shot was to lift the pipe a few inches only. The cost of each shot is calculated as follows:—

	s.	*d.*
Use of material	1	0
Labour	3	3
Pitched bag for charge	0	3
3lb. of powder at 5½d.	1	4½
15ft. fuse at 6d.	0	9
Pitch, tallow, twine, coals, &c.	0	4½
	7	0

Each shot loosened and prepared for dredging about 4 cubic yards. The cost was, therefore, about 1s. 9d. per cubic yard. The cost of dredging the material after it had been thus prepared was 2s. 3d. per cubic yard, making together 4s.

In one part of the River Clyde, extending over about 2,000 yards, the bed was greatly encumbered with large boulders, and here the dredging was assisted by the diving-bell. When the dredgers had cleared away the material which covered the boulders, diving-bells were used to clear away the larger boulders, and when that part of the channel had been cleared of them the dredgers went again over the same bottom, removing all the lighter material from the heads of the lower boulders, preparatory to the bells commencing again, and these operations were continued until the necessary depth was attained. Some of these boulders were 4 and 5 tons weight, consisting of trap rock and whinstone.

A diving-bell is a rectangular cast-iron box, with the edges rounded off usually, 6ft. long, 4ft. wide, and 5ft. high, affording room for four men, the thickness of metal being 2in. at the top and the upper part of the sides, and from 3in. to 3½in. at the bottom. The greater thickness, and therefore weight, at the bottom, is given to keep the bell steady. It usually weighs, according to Professor Rankine's "Manual of Civil Engineering, about 5 tons, and displaces about 3½ tons of water when quite filled with air; the difference being the load on the crane in the boat from which it is suspended and by which it is lowered and raised. It has a number, not usually exceeding twelve, of bull's-eyes, or glazed holes, on the top, to admit light. They are 8in. or 10in. in diameter, and the glass is about 2in. thick. A leather or other flexible pipe, about 3in. diameter, is attached to the top of the bell, and its other end in the boat is attached to a forcing-pump, which drives into the bell.

Smeaton first used this form of bell, at Ramsgate Harbour, and the manner of excavating the bottom is given in Vol. III. of his "Reports," to this effect:

The man at the pump forces down so much air to the bell as will cause the air to flow out beneath the lower edge of the bell and rise in bubbles to the surface; as long as this continues he knows that the divers are well supplied with air. The loose sand is removed by dredging from above, and then the bell is let down to the bottom, which at Ramsgate is a hard chalk rock; when it stands thereon it lays the chalk dry to the level of the bottom edge of the bell, but if the surface is uneven, the bell cannot descend so low but that it will leave 6in. or 8in. of water on the bottom. The surface of this water is the level they work to, and by cutting away every eminence which rises above the water they soon obtain a perfectly level surface. They work with a small pick, made something like a narrow adze, and as the chalk is not hard the work proceeds rapidly. When they have accumulated a certain quantity of rubbish, they knock three times on the bell, to order the people to draw it up, till they, standing on the bottom, find themselves knee deep, then two knocks to stand fast. They now take in a shallow basket let down from above, and fill the rubbish into it, then pull the rope to order it to be drawn up, and strike four times on the bell that it may be lowered down, and they proceed with their work. Having in this way hewed away the surface till the water standing equally all over it shows it to be a level plane, they give orders to be removed to a new situation, yet at so short a distance that part of the surface just levelled is still beneath the bell; in this way a uniform plane is preserved, and the rock is prepared for the stonework (to be built upon it) without any other level than the water.

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BRITISH ARCHÆOLOGICAL ASSOCIATION.

(*Concluded from page* 101.)

THE members started on Wednesday week morning for Boscobel. Several of the neighbouring gentry joined the Association as they went along, till, by the time that Chillington had been reached, the *cortége* was somewhat imposing. Longbirch, an early residence of the Giffard family, was visited. A glance of that old monastery, the White Ladies, was obtained from the carriages; and then Giffard's Cross called up the legend of the shooting of the pauper by an early Giffard, whose trusty cross-bow saved the lives of the lodgekeeper and her child. The visitors alighted again at Brewood Church, where the Hon. and Rev. Mr. Wrottesley, vicar, sketched the history of the erection, and showed the records, which are unbroken from A.D. 1562; and Mr. Planché described the Giffard effigies. At Boscobel, Mr. Harrison Ainsworth read a paper.

When Mr. Ainsworth had received the thanks of the Association for his paper, the antiquarians and their friends, led by Major Thorneycroft and his two carriages, drove through the park of Earl Bradford to the family church of Weston, which the Hon. and Rev. John R. A. Bridgeman described, assisted by Mr. Planché. Mr. Planché demonstrated that the modern effigies in the niches of the chancel erected to Knights Templars were of the dates of Edward I., certainly a century later than the mural record relating to one of them indicated.

There was now a drive of eight miles before the members, and then Patshull, the seat of the Earl of Dartmouth, the President of the Association, would be reached. At Patshull, the Association was entertained at luncheon.

After Patshull Church had been viewed, the members got back to Wolverhampton by half-past six.—In the evening, papers were read at the Town Hall.

The evening meeting, at the Town Hall, was held under the presidency of Mr. J. R. Planché. When Mr. Roberts had sketched the excursion of the morning, Mr. Levien read a paper, entitled "A Notice of Early Religious Houses in Staffordshire." The author was thanked for his contribution, and then the Chairman read his paper "On the Family of the Giffards."

The third paper was, "On the Briton, Roman, and Saxon in Staffordshire," which was the production of Mr. T. Morgan, who read it. The author mentioned in passing the conflict at Wednesfield, and the defeat of the Danes, at about the same time, at Tettenhall, whilst he touched upon the fact that Cannock Chase was the favourite hunting grounds of the Mercian kings.

The proceedings closed at a quarter to eleven o'clock, with thanks to the Chairman and to the gentlemen who had read papers.

The members and friends, numbering between forty and fifty, left Wolverhampton on Thursday, in carriages, at nine o'clock, and soon arrived at Ludstone Hall. The party were met here by the owner, by whom they were conducted over the premises. Much delight was expressed at the tapestry, probably Belgian. The house, which has a deep moat, was built by the Whitmores, in 1607, and it is curious that, after having been leased for a period of 200 years, it came back into the same family.

Subsequently Claverley Church was visited. The chief features were pointed out by Mr. E. Roberts, who explained that the earliest portion was unquestionably Norman. He recommended the cleaning off of the whitewash, and also the removal from the font of the paint, by which it was sought to make what was a mixture of stone and plaster look like gray marble. Here Mr. Wilding (of Montgomery) directed the special attention of the members to the beautiful altar-tomb of Sir Richard Broke, with his two wives. A striking market cross that had been removed from the market-place to the churchyard was explained by Mr. Roberts, who showed that the base was of the thirteenth century; and it transpired that it was originally erected to commemorate the termination of a plague that arose upon the sudden drying up of the surrounding marshes, and was at one time twice its present height.

The visitors next visited Quatford Church and the Danish Encampment, in the locality, both of which were commented on by the Rev. George Leigh Wasey.

At Bridgnorth the members took luncheon, and then were conducted over the town. The house of Bishop Percy (author of "Percy's Relics"), whose father was a grocer at Bridgnorth, was visited, and a doubtful reading of a tablet in the house elucidated by Mr. Roberts. Then the Church of S. Leonard's, now being restored, was inspected; afterwards the Castle, the rock dwellings, the hermitage, and the like, were visited. At the base of the keep of the Castle, Mr. Ward gave an excellent *resume* of the history of the town and neighbourhood, and of the castle in particular, showing how the tower, in its present leaning condition, had been brought into that state, and the rest of the Castle utterly demolished, by the Parliamentary forces under Cromwell. The Association cheered the announcement of the fact that fifty years ago the "local Goths" of that time tried to bring down the present remains of the tower, but without success.

After leaving Bridgnorth, Worfield Church was inspected, and later on, a splendid double encampment of ancient Britons, it is thought, but subsequently possessed by the Romans, was visited. It is situated at Chesterton, and it excited much gratification from the visitors.

The evening meeting was then held, with the Rev. Mr. Stephens (Wednesfield) in the chair.

Mr. J. C. Tildesley contributed a paper on "The Earlier Industries of Staffordshire," of which the following is an abstract:—The first development of minerals in the south part of the county is associated by popular tradition with Aston Furnace, near Birmingham, whither, the old chronicles say, "sea-coles" were borne on mules' backs up the old holloway from Wednesbury, in the days of the ancient Britons. In North Staffordshire, iron ore was certainly delved soon after the Conquest, for it was smelted at Uttoxeter in the thirteenth century; and coal and ironstone were both dug at Amblecote in the days of Edward III. The earliest authentic record of coal-getting in Staffordshire occurs in a deed of the Heronville family, wherein some lands bequeathed, A.D. 1315, to Johanner de Weddesbryle are described as "lying at Bradeswall (Bradley) against the cole-pits." Iron manufacture in Staffordshire was commenced soon after the Conquest; and, by the disinterment of scoria at West Bromwich and other places, a much earlier origin has been conjectured. A record of the fourteenth century mentions the raising and smelting of iron ore at Brierly Hill; and Camden, in his "Britannia" (A.D. 1580), refers to Staffordshire as "an iron-producing country." The invention of the blast furnace about that period had no doubt given considerable impetus to the industry. A century later the substitution of coal for charcoal in iron smelting by Dud Dudley marked another era of importance; and this was succeeded after the lapse of another century by the invention of the steam-engine. The first blast engine was erected by James Watt, at Bradley, near Bilston. Lockmaking was a recognised industry in Wolverhampton and Willenhall at the commencement of the sixteenth century, and before the end of Elizabeth's reign the craftsmen had become famous for their skill. Miniature locks for cabinets, locks containing bells (like the one mentioned in the "Odyssey," 21st), and locks for "bridles for scolding women" were among the curiosities of the craft at that time. Key bows were usually ornamented by the insertion of a cross, the shank being surrounded by beads. Japanning was introduced into Wolverhampton and Bilston from South Wales, A.D. 1740, the Old Hall (the ancient seat of the Leveson-Gowers) being the first factory of importance. Enamelled japan-ware, sword hilts, steel chains, and steel shoe buckles are among the now obsolete industries for which Wolverhampton was famous two centuries ago. Wrought nail making was a thriving industry in South Staffordshire in the fifteenth century, and is mentioned by Leland in his "Itinerary" (A.D. 1538) as a craft of considerable importance. Glass-making was introduced into Stourbridge in 1550, by a little band of Hungarian refugees. The site of their first factory is still known as Hungary Hill. The arts of cutting and engraving glass were introduced from Germany a century later. Leather wares, in the shape of saddlery and harness, were manufactured in Walsall as early as the year 1660, and a few years later Stafford and Stone became recognised seats of the shoe trade. Burton ale was a famous beverage in the reign of Richard I., Sir Walter Scott's allusion to that fact in "Ivanhoe" being supplemented by authentic records. The manufacture of pottery and porcelain in Staffordshire dates from the middle of the sixteenth century. It originated in the south, but soon became established in the north part of the county. For two centuries the manufacture was of the rudest type, it being reserved for Wedgwood "to convert a rude and inconsiderable manufacture into an elegant art, and an important branch of national commerce."

This paper was followed by the paper of Mr. J. W. Grover, C.E., on "Iron and Ironworks of Roman Britain."

The programme for Friday included Stafford (S. Mary's and S. Chad's Churches, the Castle, and Bury Ring), Stowe Church, Chartley, Uttoxeter, and Croxden Abbey. Some of the work mapped out for the day had to be abandoned from want of time. The party reached Stafford from Wolverhampton at nine o'clock, and were received by the Mayor. The party immediately proceeded to S. Mary's Church, where the Rector read a paper descriptive of this fine church, which was restored by Sir Gilbert Scott in 1843. At the west end of the church, on the external wall, some slight traces of Norman moulding may be noticed. On the return home in the evening S. Chad's Church was visited.

Another party visited Stowe, Uttoxeter, and Croxden Abbey. The ruins of Croxden Abbey are on a large scale, and are distinctly traceable. It is satisfactory to add that these ruins are well cared for both by their owner, the Earl of Macclesfield, and his tenant, Mr. John Carrington. Mr. Gordon Hills read a paper containing a large amount of information relative to Croxden, collected in it by the author from a MS. record of the Abbey, which gives a complete series of notices of its abbots for the first 200 years of its existence, in which the dates of the erection of its various portions were accurately defined.

On Saturday the Association went to Dudley, where the members were received at the Institute and Museum by the Mayor and Corporation, who then led them to the Castle, where Mr. E. Roberts pointed out the leading features at the Priory, and read a paper upon the Castle. Before leaving the Castle grounds the Association were conducted through the caverns, which had been specially illuminated for the members, who expressed their great delight at what they saw in these vast galleries, which owe their formation to the excavations for the Silurian limestone. The visitors drove on to Stourton Castle, where Mr. G. W. Wright read a paper upon Cardinal Pole. The author claimed for Stourton that it was the birthplace of the Cardinal, whose life he reviewed. The members were shown a sleeping apartment where it was maintained that the Cardinal was born, and over the doors of which there were carvings, which were said to be portraits of this celebrated ecclesiastic. On their way home, Halbeach was halted at, and the chimney pointed out in which the Guy Faux conspirators concealed themselves before their arrest.

In the evening, the Association was officially entertained at a *conversazione* in the Town Hall of Wolverhampton, provided by the Mayor of the borough, and for which some 350 invitations were issued.

About 300 ladies and gentlemen accepted the invitation of the Mayor and Mrs. Ford to attend the *conversazione*.

At the close of the entertainment the company assembled in the Council Chamber, where the Mayor presided, with Lord Wrottesley on one hand and Mr. Gordon M. Hills on the other, Mr. E. Roberts and other members of the Association surrounding him. —Lord Wrottesley, speaking as a vice-president, hoped that the members of the Association had not been disappointed by what they had seen in that neighbourhood. He was sure that the inhabitants had derived nothing but profit and pleasure and instruction from the visit that had been paid them. The Wolverhampton Congress, he trusted, had been as agreeable and successful a one as had hitherto been held by the Association.—Mr. Hills spoke of the Congress having been most prosperous and pleasant. He tendered the warmest thanks of the Association to the Mayors and Corporations of Wolverhampton, of Stafford, and of Dudley; to the ecclesiastics; and to the private residents, who had all, in every possible way, contributed to the object of the Association; and he concluded after saying that the county of Stafford might well be proud of the ecclesiastical buildings it possessed.

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THE STRENGTH OF BRICKWORK.*

(*Continued from p.* 109.)

It will be necessary now to consider briefly the ultimate tensile resistance exhibited by brickwork under a direct pull, and not as in the preceding experiments, through the indirect agency of a transverse stress. From the nature of the material under consideration, it may be anticipated that, practically, the direct tensile resistance, f_1, will be equal to f, although it is well known that in some other materials, such as wrought and cast iron, the value of f_1 is sometimes less that $\frac{1}{2}f$.

The tensile strength of a mass of brickwork will obviously be limited by the intensity of adhesion of the cement to the bricks in some instances, and by the intrinsic strength of the cement and bricks respectively in others. In new or green work the strength of the cement wlll govern that of the whole mass, but after the lapse of a certain period, varying with the nature of the cement, the bricks, if badly selected, will often prove the source of weakness. However inferior the bricks may be, the mass of brickwork must, nevertheless, if the cement be good, possess considerable tensile strength. In any cross section the area of the cement joints will amount approximately to one-seventh of the entire sectional area; hence, if the bricks possessed absolutely no intrinsic strength, the average resistance per unit of area of the entire mass could not be less than one-seventh of that of the cement employed.

General Pasley states the average adhesion of two bricks cemented together with Portland cement to be 5000lb., or, say, $f_1 = 140$lb. per square inch. Vicat takes the adhesion as equal to the tensile strength of the cementing material, and gives the following values to f_1, one year after mixture:—

	Pounds per sq. in.
Good hydraulic lime	$f_1 = 170$
Ordinary „ „	$f_1 = 140$ to 100
Rich lime	$f_1 = 40$
Good hydraulic mortar	$f_1 = 140$
Ordinary „ „	$f_1 = 85$
Good common mortar	$f_1 = 51$
Bad „ „	$f_1 = 21$

Rondelet cites 33lb. per square inch as the adhesion of common mortar to brickwork six months after mixture, and this conclusion is verified by the results of some experiments carried out by Mr. Robertson in the year 1858, when the adhesion of well-ground mortar, six months after mixture, was found to be as follows:

	lb.
Well-ground mortar and blue bricks	$f_1 = 40$
„ „ „ gray stocks	$f_1 = 36$
„ „ „ soft place	$f_1 = 18$

The inferior results obtained with the soft bricks were due to the water being taken up by the bricks, and consequently not being available for the formation of silicates.

In the same series of experiments the adhesion of cement to gray stock bricks at the end of one week and of one month respectively, after mixture, proved to be as follows:

	lb.
Quick-setting cement, 1st week	$f_1 = 23$
„ „ 4th „	$f_1 = 30$
Slow „ „ 1st „	$f_1 = 15$
„ „ 4th „	$f_1 = 59$

The very exhaustive series of experiments carried out by Mr. Grant on Portland cement of the best quality afford valuable information as to the progressive increase in the strength of cement during the first year of its age. The average results of his experiments upon cement weighing 112lb. to the bushel are fairly represented below for the proportions of cement and sand referred to:

Material.	One Week.	One Month.	Three Months.	One Year.
	lb.	lb.	lb.	lb.
1 cement to 2 sand	$f_1 = 23$	55	113	205
1 „ 2 „	$f_1 = 43$	137	163	310
Net cement	$f_1 = 200$	300	390	480

With cement of the unusually great weight of 123lb. per bushel, the corresponding increase in strength at the early stages was very noteworthy, as will be seen by the following tabulated results:

Material.	One Week.	One Month.	Three Months.	One Year.
	lb.	lb.	lb.	lb.
1 cement to 1 sand	$f_1 = 157$	200	243	317
Net cement	$f_1 = 365$	415	470	545

With Roman and Medina cement the results obtained by Mr. Grant were very unsatisfactory, as will be seen from the following summary of about 500 experiments:

	1 week.	1 month.	3 months.	1 year.
	lb. lb.	lb. lb.	lb. lb.	lb. lb.
Net cement. f_1 =	42 to 106	93 to 168	71 to 208	96 to 300

With an admixture of sand the results were so irregular as to render a record of them useless.

The preceding Tables epitomise the results of several thousands of experiments on the tensile strength of cement and mortar; it will, therefore, be unnecessary to adduce further evidence. At first sight the irregularity of the results attained, as regards the direct tensile strength of brickwork, may appear inconsistent when compared with the comparatively uniform value of the same resistance as deduced in the previously cited experiments upon transverse strength. If it be remembered, however, that in the case of the brick beams submitted to test, high class cement alone was used, the apparent discrepancies vanish, and it will be evident that, practically as well as theoretically, the values of f and f_1 may be taken as identical. If due consideration be given to the latter series of experiments, it will also be evident that the great strength of the Nine Elms and Exhibition brick beams was not, as suggested by Brunel, due almost wholly to the hoop iron bond, but that, on the contrary, the introduction of the iron had, as asserted by the experimenters themselves, little to say to the question of resistance.

The variance in the results attained in both series of experiments might also be cited by some engineers as a sufficient justification of their habitual exclusion of the element of tensile resistance in any calculations referring to brickwork; although, as a matter of fact, and as already shown, all engineers rely, though it may be unconsciously, upon this property of brickwork in the practical execution of their works. But this position is not tenable, since it may readily be shown that quite as wide a variance in the results is exhibited by brickwork under compression. Thus many hand-made ill-burnt bricks will not bear a pressure equivalent to but 14 tons per square foot without crumbling, whilst not very long ago one unprecedently strong machine-made brick by Clayton & Co., was found by Kirkaldy to sustain a pressure equivalent to no less than 323 tons per square foot—a variance quite as wide as any exhibited by brickwork under tensile strains. Many of the bricks supplied by the same makers for the Midland Railway and Thames Embankment contracts bore 95 tons per square foot before cracking to any extent, 133 tons before cracking to a considerable extent, and 190 tons before crushing throughout.

Piers of compressed bricks 2ft. 6in. high by 8½in. square were tested by Mr. Robertson, and found to sustain 50 tons per square foot when set in gray stone lime, and 200 tons when set in Portland cement. Clarke found that the resistance to crushing of rather soft bricks set in cement averaged 34 tons per square foot, and many other experiments might be cited to show that this amount fairly represents the average resistance of ordinary stock bricks set in ordinary good mortar. Grant's experiments show the crushing resistance of bricks made of net Portland cement to be 243 tons per square foot when three months old, and 385 tons when nine months old, whilst, with the addition of one part of sand, the rsspective resistances were reduced to 160 tons and 292 tons, and with five parts of sand to 61 tons and 108 tons per square foot. Properly made concrete, consisting of one part of gray stone lime to six parts of ballast, is at least as strong under compression as good stock brickwork; and concrete made of one part of Portland cement to nine parts of unscreened ballast has been found to possess ample transverse strength for fence walls and similar works.

(*To be continued.*)

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* From *Engineering.*

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WESLEYAN METHODISM AND CHAPEL BUILDING.

The growth of Methodism has been commented on as one of the most extraordinary religious phenomena of modern times. Like all other religious bodies, from the "Old Catholics" to the Quakers, the Wesleyans are falling in with the fashion of building new chapels. The connexion is sufficiently wealthy to expend upwards of £200,000 annually on the building or completion of "chapels, organs, schools, or ministers' houses." But this, even, is not satisfactory to some of the more wealthy members of the community, who think they ought to imitate the example set by the Bishop of London's Fund. It is proposed to raise in addition a fund without delay, by contributions spread over a few years, of half a million sterling, and half of this sum is to be appropriated to the erection of additional chapels over the country.

Whatever is worth doing is worth doing well, and we hope the chapels that are to be erected will be of more satisfactory character architecturally, and more substantial in their construction, than many of the edifices erected during recent years by the Wesleyans.

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ARCHITECTURAL ASSOCIATION.

The following is the programme of the Northamptonshire Excursion, which commences on Monday next, under the guidance of Edmund Sharpe, Esq., M.A., F.R.I.B.A.:—

On Monday, the 19th inst., the party will leave the King's Cross Station, London, by the 7.50 a.m. train, and will arrive at Peterborough at 10.16, from thence they will proceed by the Midland Railway, leaving Peterborough at 10.32, and arriving at Stamford at 10.52 a.m. The following places will be visited:—Burghley House; Stamford, S. Martin's; S. Mary's; Brown's Hospital; S. John's; All Saints'; S. George's; S. Leonard's; Free School, Whitefriars, &c. The dinner will take place at the George Hotel, Stamford, where the party will remain for the night. Mr. Sharpe will deliver an address at the George Hotel, at 7.30 p.m.

On Tuesday, August 20th, the excursionists will leave Stamford at 8 o'clock, and will proceed in carriages to Uffington, West Deeping, Market Deeping, S. James, Deeping, Northborough, Elton, Helpston, Bainton, Barnack, and back to Stamford.

On Wednesday, August 21st, the party will leave Stamford by the 8.20 a.m. train for Elton, where they will be met by the carriages, and conveyed to Fotheringhay, Warmington, Tansor, Cotterstock, Polebrooke, Barnewell, S. Andrew, Tichmarsh, Thorpe Station (Tithe Barn), and Oundle. Oundle Church will be visited after dinner.

On Thursday, August 22nd, the party will leave Oundle by the 7.19 a.m. train for Thorpe, where they will be met by the carriages, and the rest of the journey will be performed in them. The following places will be visited:—Aldwincle, S. Peter's; Aldwincle, All Saint's; Lowick, Islip, Woodford, Denford, Ringstead, Raunds, Stanwick, and Wellingborough.

On Friday, August 23rd, carriages will leave Wellingborough at 8 o'clock, for Finedon, Irthlingborough, Higham Ferrers, Rushden, Irchester, Earls Barton, and Northampton—S. Peter's. The whole of this day's journey will be performed in carriages.

On Saturday, August 24th, the excursionists will visit Northampton—S. Sepulchre's, S. John's Hospital, Cogenhoe, Whiston, and Castle Ashby. The final dinner will take place at Northampton, at 3 p.m., which will enable members to leave by the 5.15, 5.38, or 8.5 p.m. trains for London.

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Ephesian Treasures at the British Museum.—The largest and most important of the fragments of the carved column dug up by Mr. Wood, at a depth of 23ft. on the supposed site of the Temple of Diana, at Ephesus, has been set up in the Græco-Roman room at the British Museum. It measures about 6ft. in height, and 18½ft. in circumference; and is supposed to have formed a portion of the first drum of one of the 36 Ionic carved columns, which, with 91 others, supported and adorned the edifice. Portions of the base and capital of the column were also found close by. On the side of the drum, which has sustained comparatively slight injury, there are five figures of considerable beauty, but all are more or less mutilated. Of only two of these can the identity be determined—namely, the figures of Mercury and Victory. The former is perfect with the exception of the face, which is slightly mutilated.

Building Intelligence.

CHURCHES AND CHAPELS.

Ashbury.—The Church of S. Mary, Ashbury, Devon, was reopened last week, after its complete restoration at the cost of the Ven. Archdeacon Woollcombe. The old church, which, with the exception of the tower, was taken down in the summer of last year, possessed a few features of interest, though much dilapidated. That a structure existed at a very early period was evinced by the discovery, during the demolition of the walls, of a small Norman capital, a portion of a shaft, and of a piece of elvan stone about 3in. thick, shaped somewhat like a bench end, which is conjectured to have formed part of a sedile. The jambs, label, and sill alone remained of the original east window: these portions have been carefully preserved, and the delicate mouldings on the label indicate that they date from the latter part of the fourteenth century. The age of the old windows in the nave is not so easily determined; they appear to have been copied during or after the decline of Christian art from earlier work, which probably then existed in the church. They would be taken for Early English work, of which they are close imitations, by those not versed in Pointed details. Of Mediæval woodwork of roofs or seatings not a vestige has been found, all was doubtless consumed when the old church was injured by lightning in the early part of the eighteenth century. The modern roofs were constructed of timber, insufficient in size and much decayed. The new church has been erected on the site, and of the dimensions of the old structure. It consists of nave, chancel, and porch, with the ancient tower at the west end, and opening into the nave with a somewhat late arch of depressed form. The length of the nave and chancel internally is 44ft., of which 19ft. are apportioned to the chancel. The width of the nave is 16ft., and of chancel 15ft. 3in. The walls are built of rubble work pointed externally and plastered within. All the arches, splays, quoins, copings, crosses, and other dressed masonry are worked out of stone from Rutleigh quarry, resembling the well-known Hatherleigh stone. A bold arch divides the nave from the chancel. The ribs of the arch are moulded, and rest on carved corbels, which are excellent studies of lilies, passion flowers, roses, ferns, wheat, vine, &c. The choir is elevated two steps above the nave, and the altar three more on a foot-pace. In the east window, into which the ancient masonry has been carefully worked, is some very effective stained glass, designed and executed by Clayton & Bell. The paving of the choir and sacrarium is of Maw's tiles. The roofs are of entirely seasoned English oak. The works have been carried out by Mr. John Dendle, of Barnstaple, from designs by Mr. J. F. Gould, architect, of the same town. The carving was executed by Mr. G. Vickery, the foreman of the works.

Boughton, Norfolk.—The restoration of the parish church is progressing, and it will be reopened in September. The chancel and porch are rebuilt, and the nave and tower repaired and re-roofed. The entire area is being re-fitted. Mr. Withers is the architect, and Messrs. Bardell, of Middleton, the builders. The outlay will exceed £800.

Camberwell.—A new (Roman) Catholic church was opened on Monday morning in Camberwell New-road. The church is in the Early English style of the twelfth century, 98ft. long, and 47ft. wide, and is intended to accommodate a congregation of 2,000. The architect is Mr. C. A Buckler, and the builder Mr. Fanthorpe, of Notting-hill.

Clifton.—The beautiful church of All Saints, Clifton, was opened on Thursday week. It is seven years since its erection was commenced, from designs by Mr. G. E. Street. The costliness of the design precluded any sudden advancement with the edifice; and for some years after the chancel had been consecrated, a temporary nave alone could be used. As funds were collected, the permanent nave was undertaken, and its walls gradually ascended, enclosing the temporary structure, which has recently been removed. The length of the nave is 111ft., from what, for the sake of convenience, may be called the west end to the chancel arch wall, and its width 56ft. The height from the floor to the roof plate is 43ft. 2in.; and from the floor to the apex of the decorated roof, 63ft. 2in. Externally, from the floor to the top of the gable coping the height is 81ft. 3in., and from the floor to the top cross 85ft. 1in. Native stone was employed, with dressings of Box stone, and slate for the roof from the Delabole quarry in Cornwall. The pillars of the interior are of red Mansfield stone, having bases of pennant and the sub-bases of Box stone. Messrs. Davis & Son, builders, of Bristol, obtained the contract for this portion of the church. Messrs. Bell & Almoad, of Charlotte-street, Fitzroy-square, London, decorated the interior of the nave roof, from the designs of Mr. Street. There are two large windows at the west end; it is intended to fill them in with stained glass, at a cost of nearly £1,000. On each side of the nave are five painted windows, the themes forming a history of the Bible from the beginning to the time of the saints. There are to be 120 subjects, and in addition the tracery of the windows is filled in with symbolic subjects. This work was entrusted to Hardman, of Birmingham. Conspicuous features on each side of the nave are arched recesses underneath the painted windows. These are understood to be an adaptation from a church in Seville, where each recess contained an altar. In the present instance the walls in the different archways were pierced for lancet windows, containing figures of the saints who had lived in England. It is of Caen stone, and the work of Mr. Redfern. At present about £27,000 has been spent upon the church, and between £2,000 and £3,000 is required to satisfy the claims yet outstanding. All the details in connection with the structure have been carried out under the careful supervision of Mr. E. Honey, Mr. Street's clerk of the works.

Crowan.—Crowan Church, Cornwall, was reopened on the 25th ult., after having been restored by Mr. J. P. St. Aubyn, architect, at a cost of £2,000. The east and west windows are by Messrs. Lavers & Barraud, of London. The reredos, by Powell & Son, was the gift of the architect.

Dorrington.—A new reredos, in Caen stone, has just been added to Dorrington Church, Shropshire, as a memorial to T. H. Hope-Edwardes, Esq. It consists of a carved central subject, representing "The Adoration of the Kings." On either side, in niches, are figures of Edward the Confessor and S. Andrew, to whom the churches of Dorrington and Condover are dedicated. Devonshire marble shafts, with carved capitals, also a carved cornice and diapers, help to further enrich the central part of the reredos, which is exactly the width of the east window, the spaces north and south being filled up by arcades having carved capitals, marble shafts, and carved panels, &c. Mr. T. Earp, of London, executed the whole of the work, from a design by Mr. E. Haycock, architect, Shrewsbury.

Easton-in-Gordano.—The Church of S. George, Easton-in-Gordano, was reopened on Wednesday week after restoration, nothing now remaining of the original edifice but the tower. The architect to the new building is Mr. Christian, the architect of the Ecclesiastical Commissioners, and the contract was carried out by Messrs. Hayes & Sons, of Bedminster, at a cost of £2,100. The style is Gothic, and the edifice consists of a nave, chancel, and aisles, with pillars of Hammil stone, and arches of the same material, intermixed with Box stone. The walls are built of stone of the neighbourhood, the roof is of slate, and the windows of freestone.

Islington.—S. John the Baptist, Cleveland-road, was consecrated by the Lord Bishop of London on the 6th inst. The church consists of nave, aisles, chancel, chancel aisles (comprising organ chamber on the south side and vestry on the north), with bell côte rising above the chancel arch. There are three porches, one to vestry and one to each of the aisles. The style is Early Curvilinear, and the building is erected of brick, with stone dressings, tracery, &c. The interior is of brick, ornamented with coloured work, with bands, devices, &c. The chancel is a semi-octagon, with north and south arcades to the vestry and organ chamber. The nave is separated from the aisles by five bays, having stone shafts and capitals and bases and stone arches. The roof is open-timbered, and the seats are of deal, stained and varnished. The chancel stalls are carved, and have reading-desks at the west ends on each side. The pulpit is of stone, enriched with carving. The whole has been erected under the superintendence of the architect, Mr. Wm. Wigginton, F.R.I.B.A., of Cornhill, save the temporary font, which was a gift. The whole cost, including fencing and lighting, will be under £4,000, and the accommodation is for between 700 and 800. Mr. Heath, of Hornsey-road, is the contractor.

Tewkesbury Abbey Church.—The restoration of Tewkesbury Abbey Church is about to be put in hand at once, a parishioner, Mr. T. Collins, having undertaken the bulk of the work at his own cost. The work to be done comprises the removal of the galleries and the substitution of an equal number of sittings in other parts of the church, the conversion of the present square pews into ordinary ones, and the removal of the pulpit to a more convenient position, including the restoration of the stonework, which was greatly damaged when the galleries were erected.

Welton.—The foundation-stone of the new church has been laid at Welton. The contractors are Mr. J. Wilson, of Gaitsgill, for the mason's work, and Mr. Pearson, of Wigton, for the joiner's work. The building will be of local red stone. It will consist of a nave and chancel of one height, with a gabled projection for the vestry and organ chamber. The architects are Messrs. Cory & Ferguson, of Carlisle. The church will accommodate 100 persons.

Winchester.—Part of a new church, consisting chiefly of a large chancel, was consecrated on the 27th ult. by the Bishop of Winchester, in the growing parish of Weeke, or Wyke, in that city. The building, which occupies the site of an ancient church dedicated to S. Anastatius, is designed by Mr. J. Colson, architect, the pulpit, lectern, communion, and credence tables being the gift, as well as the workmanship, of the rector of the parish, the Rev. J. L. Barton, assisted by a pupil.

Ysputty Ystwith, Cardiganshire. — This church is about to be pulled down and the site removed, whereon it is intended to erect a new church from the designs of Mr. Withers, of London. The nave and chancel will be under one roof, with an attached tower 16ft. square forming north-west porch. The work will be done by Messrs. Jones, of Lwyngog, for £865, stone and carriage given.

BUILDINGS.

Devon.—In our issue for May 14, 1869, appeared some account of Marley House, near Exmouth, the seat of J. Brice, Esq., and erected a few years ago at a cost of about £40,000, from the designs of Mr. G. P. Benmore, architect. A further addition, in the shape of a new lodge, has just been erected. It is situated upon the Lymstone-road entrance to the park, upon a site affording a view of coast and inland scenery which has few rivals for beauty in England. The building is of an highly ornamental character, and is built of Combe Down stone upon a deep plinth of blue limestone. A richly-carved cornice supports the roof, and a carved string runs round the building at the springers of the window heads, the character of the ornament being strictly in keeping with that upon the mansion, and executed by the same artist. The gateways are also of limestone and Combe Down. The gates are good samples of ironwork, and reflect credit upon Messrs. Garton & King, of Exeter, by whom they have been made. The stone carving is by Mr. Harry Hems, of the same city. The contractor for the whole of the works was Mr. Burridge, of Exmouth, who has also had in hand extensive alterations, &c., at Bystock, a neighbouring mansion, at which resides Mr. Brice's eldest son.

SCHOOL BOARDS.

Batley.—On Thursday week, at the meeting of the Batley School Board, a series of instructions to architects competing for the premiums offered by the Board for designs for a school proposed to be erected at Purlwell was read. The school is to accommodate 300 boys, 250 girls, and 150 infants. One condition was that the school was not to exceed a cost of £4,000, exclusive of boundary wall and internal fittings. It was thought that the limit had been placed too low, and ultimately it was agreed to extend the sum to £5,000, and that each set of plans should be accompanied by an estimate showing the total cost not to exceed that sum, the Board reserving to themselves the right to reject any tender exceeding £5,000, and proceed to a new selection.

Bradford.—The Bradford School Board have adopted builders' tenders for five schools, a portion of the number intended to be erected in various parts of the borough. The total expenditure in erecting these five schools, irrespective of the cost of sites, will be £44,221, which is nearly £20,000 in excess of the estimates made by the architects at the time the plans were prepared.

Ross.—At the last meeting of this Board it was unanimously resolved that Mr. Pearson be instructed to prepare plans and specifications for the erection of new schools; also of boundary walls, and the levelling of the Henry-street site. The building to be of native stone, and the proportions according to the letter received from the Education Department, and the resolution passed by the Board at the meeting held on the 20th ult.

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Halesworth.—A stained glass window has just been placed in the south aisle of Halesworth Church. The principal scene represents the Ascension of our Saviour, the expression and colouring being truly admirable. Beneath is the memorial inscription.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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Satchell and Edwards.—Drawing to hand.

A Youth.—One competition at at a time is enough.

X.—We believe not.

J. B. Rusticus.—You can follow your own inclination about binding the Building News. The best way is to buy the cases and send the work, with the cases, to some bookbinder. You will find it neater, cheaper, and more expeditious than binding the volumes yourself.

Salmon, Son, & Ritchie.—Elevation and plan to hand. Both will appear.

C. F. Fewster.—There were difficulties in the way of reproducing the illustrations of "Monuments of Art."

Correspondence.

"GREEK *VERSUS* GOTHIC."

To the Editor of the Building News.

Sir,—Like to a grain of mustard-seed, which is the least of all seeds, but becometh a tree, the controversy on "Modern Scottish Ecclesiastical Architecture" has grown—if, indeed, it has not, as an arboriculturist would phrase it, been "forced"—into the imposing proportions of a disputation on "Greek *versus* Gothic." At least this is the title now required by "Another Protestant and Architect" in his continuation of his discussion, and I suppose that if I would not "be snuff'd out by an article," I must be contented to accept it.

While nothing is known of the professional *status* of "Another Protestant and Architect," I am myself well-known to my professional brethren in Glasgow, and by many of them it may be regretted that an "enterprise of such great pith and moment" as the defending of Greek architecture should be in the hands of an architect in so humble a position as I am. Dr. Johnson says, in "Rasselas," "What cannot be repaired is not to be regretted;" and some of those who may regret now may, perhaps, repair hereafter. Meanwhile I must support what I said:—That if any consideration is given to the plea sometimes urged, that to the Church ought to be given nothing less than the best achievements of human genius, then Greek architecture must be much more appropriate than Gothic. Now, in saying this, I say what I mean and mean what I say—not "that the Greek is the true style for Protestant churches, because its beauty aims at unadorned simplicity," but that Greek architecture must be much more appropriate than Gothic for a place of worship if any consideration is given to a certain stated plea. As Touchstone says, there is "much virtue in If."

I have now only to show that in architecture the greatest achievements of genius have been by the Greeks. This, I think, may be inferred from the quality of the people. The greatness of the antique Grecian mind is readily illustrated. Eloquence, poetry and sculpture, moral philosophy, and the higher mathematics, all happily conspire in discovering an imagination, judgment, sublety, and abstraction such as has never perhaps been exhibited by any other people. Where such qualities existed architecture could not fail to achieve its chiefest triumphs. It attained perfection in the golden age of Pericles—in the most brilliant period of the history of perhaps the most intellectual people that the world has ever known; and although the Parthenon and the Erectheon were erected centuries before the Dark Ages had invented the pointed arch, and although other styles, in the caprices of fashion, have attained an occasional popularity, yet Grecian architecture, "secured in its existence" by imperishable principles, still reigns and "flourishes in immortal youth" as if years could "not wither," nor could "custom stale." To what experience in architecture can we more legitimately and reverently look than that which, left to us by a people so pre-eminently intellectual as were the Greeks, is after the varied changes and chances of more than twenty centuries still perpetually recurred to in exemplification of the beautiful. This plea of the test of antiquity is well argued by Dr. Johnson in his famous preface to "Shakespeare." "Antiquity," says that celebrated critic, "like every other quality that attracts the notice of mankind, has undoubtedly votaries that reverence it not from reason but from prejudice. Some seem to admire indiscriminately whatever has been long preserved, without considering that time has sometimes co-operated with chance; all, perhaps, are more willing to honour past than present excellence; and the mind contemplates genius through the shades of age as the eye surveys the sun through artificial opacity. To works, however, of which the excellence is not absolute and definite, but gradual and comparative; to works not raised upon principles demonstrative and scientific, but appealing wholly to observation and experience, no other test can be applied than length of duration and continuance of esteem. What mankind have long possessed they have often examined and compared, and if they persist to value the possession, it is because frequent comparisons have confirmed opinion in its favour. The reverence due to writings [or, as we may say, buildings] that have long subsisted arises, therefore, not from any credulous confidence in the superior wisdom of past ages, or gloomy persuasions of the degeneracy of mankind, but is the consequence of acknowledged indubitable positions that what has been longest known has been most considered, and what is most considered is best understood."

But I ask to be permitted to support my position by giving the opinion of those whose words might be expected to command attention whether mine will or not. "No prophet is accepted in his own country," and "Another Protestant and Architect" addressing your readers from Edinburgh, may, consequently, care little for the opinion of the late D. R. Hay. I will, however, try him with it. Mr. Hay says, in his "Harmonic Law of Nature," that "for nearly three centuries, and throughout a whole country politically divided into states often at war with each other, works of sculpture, architecture, and ornamental design were executed, which surpass in symmetrical beauty any works of the kind produced during the two thousand years that have since elapsed. So decided is this superiority, that the artistic remains of the extraordinary period to which I allude are, in all civilised nations, still held to be the most perfect specimens of formative art in the world." The opinion I now quote is from an authority that "Another Protestant and Architect" may perhaps more readily recognise. It is that of the Rev. Mr. Petit. "Another Protestant and Architect" says that "the architecture of the Greeks was only the setting to the sculpture, and without it it seems to have a very lifeless beauty, which repetition would soon exhaust." Now, this is what Mr. Petit says on this matter:—"What I now notice is [he is speaking of the Parthenon], that scarce a vestige of sculpture remains in the mass of marble before us; and yet, as an architectural composition, it gives the idea of completeness. I believe that if no sculptor had touched with his chisel a block of the marble of which it is composed, the Parthenon would still be, as it is, an architectural triumph; and we know that it was fully enriched with the finest sculpture that any age has produced, that it was built with the view of being so enriched; that it was intended to give such sculpture the greatest possible dignity, and to exhibit it to the highest advantage; and also to receive from it the greatest amount of adornment. Had we seen it fully enriched with its sculptures, we should have thought them a necessary part of the fabric; seeing it without them, we feel no imperfection as resulting from their absence. I say this advisedly. Pœstum has no sculpture, and does not want it; nor could I distinguish any tokens which would lead me to think that sculpture had been much employed in its decoration. . . . The Doric style may be worked out in a high degree of perfection without the aid of sculpture, and yet admits, without comprising its own character of simplicity, sculptures of the highest order, on which also it confers dignity by the positions which it assigns them." And of Greek art, as among the best achievements of human genius, Mr. Petit remarks: "To what a height the Greeks carried refinement we see in that unequalled work, the Parthenon, a building of whose impressiveness no description, drawing, engraving, photograph, or model, can possibly convey the slightest idea. . . I certainly never felt so powerfully impressed with a sense of the sublime by any work of art." As the *Ecclesiologist* is a journal against which I think the Goths cannot have much to say, there can be no harm in quoting it. In a review of an essay by Mr. Alexander Thomson, of Glasgow, entitled "An Inquiry as to the Appropriateness of Gothic Architecture for the Proposed Buildings for Glasgow University" (and which essay I would advise "Another Protestant and Architect" to read and think over), the *Ecclesiologist* says that "Greek art was essentially original," and that "the Greeks created an architecture as nearly perfect in every way as the human intellect can conceive." In his lectures at the Royal Academy, Mr. Smirke remarks that "a refinement was attained by the Greeks which no succeeding age has ever reached, or been capable, he might truly say, of fully appreciating," and that "perhaps it would be difficult to point to a more striking evidence of the wonderful æsthetic cultivation of the Greek mind than the exquisite delicacy of their mouldings."

Had you space for further quotations upon Greek architecture in general, I would have no difficulty in giving them. Enough may have been said upon this; it remains, however, that I should look to some of "Another Protestant and Architect's" arguments in particular. "He does not suppose that the subtle curves of the Parthenon, or the theories of beautiful proportions which critics at one time discovered, were ever calculated by the builders on mathematical or optical principles." Mr. Hay, of Edinburgh, seems to be of a different opinion, and in his essay on the subject he refers to other "critics" who have given to it some attention, such as Müller, who, in his "Ancient Art and Its Remains," "shows clearly that some certain fixed principles, constituting a science of proportions, were known in Greece, and that they formed the basis of all artistic education and practice during a certain period;" and Mr. Penrose, who, "like all who have studied the subject, has arrived at the belief that by some means or other a law of harmonic proportion seems to govern the orthography of the Parthenon." Mr. Watkiss Lloyd apparently "supposes" differently from "Another Protestant and Architect," for he read to the Royal Institute of British Architects a paper "On the General Theory of Proportion in Architectural Design and Its Exemplification in Detail in the Parthenon." The Rev. Mr. Petit speaks in his essay of "those invisible curves which have been discovered by accurate measurements, and which are only perceptible from their correction of optical errors."

Again, "Another Protestant and Architect" says "that there is far more of constructive genius, and to his eye a grander resultant beauty, in the Gothic cathedral," . . . "that their climate gave them an apology for their waste of materials in the depth of pillared porticos and huge entablatures." I may have been wrong in supposing that the question before us is not construction but art, not the materialistic but the idealistic, but if constructive genius and economy of materials are the criteria by which architecture is to be judged, then it may be said safely that the big box for the Exhibition of 1851 was not only the largest but also the greatest modern building in the world. Waste of materials, forsooth! It was of this "waste of materials" that Mr. Petit said, "I never felt so powerfully impressed with a sense of the sublime by any work of art;" that an American author[*] wrote, "the noblest monument of architectural genius which the world ever saw." Waste of material! As "grand a resultant beauty in a Gothic cathedral" could not be effected by the materials twenty times over. Suppose a Gothic cathedral of the material bulk of the Parthenon, and a Grecian temple of the size of York Minster. Gothic buildings are imposing only when they are huge. But with "Another Protestant and Architect," "constructive genius" is the great thing—the *sine qua non.* "In such churches the only thing likely to be worth looking at as a work of skill will be the roofs, and these cannot be seen for plaster." In Glasgow those Greek churches which have been conceived and expressed most thoroughly in the spirit of the style have all exposed roofs—works of beauty as well as skill—and in the most recent of them there is not from foundation to ridgeboard one single cubic inch of plaster except that which is used in the bedding of the windows.

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[*] J. L. Stephens.

"Another Protestant and Architect" "sees nothing extraordinary in the opinion that the Classic gains in beauty as it approaches the variety for which Gothic is conspicuous; Gothic developed its beauty by study of the Classic of the Empire." The "Classic of the Empire" does not happen to be just now before us. "Another Protestant and Architect" has thought fit to title the controversy "Greek *versus* Gothic." However, what he said formerly is something very different—that "the Classic satisfies our feeling of the beautiful just in proportion as it borrows the spirit of the Gothic in the complexity of its details." Had he ventured to say that "the *Greek* satisfies," &c., I would have had no hesitation in telling him that he did not know what he is writing about. But to an architect who addresses your readers from "the Modern Athens," yet who has never seen the High School on Calton Hill, or the Royal Institution on the Mound, I need say nothing further. I only regret having occupied so much of your space in the illustration of what to most must seem a self-evident proposition.—I am, &c.,

Glasgow, August 9. Thomas Gildard.

PLYMOUTH ARCHITECTURE.

Sir,—In my last letter I confined my remarks to "H.'s" notes on Plymouth proper, but as "Quatrefoil" has widened the field I beg to follow suit. Though far from agreeing with all his commendations I shall confine myself to noticing his curt and sweeping condemnation of the "very ordinary district churches." Now, of the five modern churches in Devonport, all of them designed between 20 and 30 years ago, one of them, S. Michael's, is the work of Mr. Ferrey, and was built under very adverse circumstances, the funds being wholly inadequate for the purpose, and a very large portion of them sunk in foundations. The building may be considered the replica of one erected by the same architect, at the same time, in Yeovil, and there the same amount of funds produced a far superior effect, as I can testify from my own knowledge.

The remaining four churches are Mr. St. Aubyn's work, and of the first of them, S. Paul's, I would remark that he had to provide for a very large population on a site of some 65ft. square, with houses on both sides, and with but £3,000 at his command. Here, with the exception of the tower and spire, which are both stunted, and had better have been left unfinished, I do not see that there could well have been any improvement. The second church, S. James, had sufficient funds for an ordinary building, but, unfortunately, the architect's orders were to seat 1,200 persons on the ground, consequently the funds did not allow of anything in the way of decoration, but now that it is grouped with the vicarage and schools, I am far from thinking it "very ordinary." The remaining two churches, S. Mary's and S. Stephen's, I consider to be above *par*, though I could have wished that the architect had chosen clerestoried buildings instead of the diocesan type of span roofed aisles. The interiors of both are effective, and the towers of considerable beauty. Add to these the church which Mr. St. Aubyn is building in Plymouth, and which promises to be the most striking modern work in the diocese, and I do not think that he need be afraid of his reputation suffering with posterity.—I am, &c.,

A Plymouthian.

P.S.—I may add that the Cornwall-street school, which "Quatrefoil" admired, is Mr. St. Aubyn's work, though he does not give him the credit for it; and he might have made a note on a Nonconformist Chapel near the Mechanics' Institute, which I believe to be from Mr. Norman's designs, and certainly shows an advancement in dissenting architecture. As regards the entrance gates and lodge of Devonport-park, I can only say that tastes differ. If it is photographed I should like "Quatrefoil" or some one to send you a copy.

S. MARY-LE-STRAND CHURCH.

Sir,—The muddling propensities of vestrymen are proverbial, and a recent example of the fitness of cheesemongers and others to deal with matters architectural deserves the notice of your readers. It will be remembered that not long ago a handsome sum of money was paid to the authorities of the Church of S. Mary-le-Strand for the appropriation of part of the ground belonging to that church for the purpose of widening the thoroughfare of the Strand, which at that particular spot was exceedingly narrow and inconvenient; this alteration necessitated a new boundary wall on the improved line, and it is to this wall that we desire to direct attention.

The piers of the old western gates have been suffered to remain, and from one of them on the south side has been started the new dwarf wall, curved and continued eastwards; this wall is about 3ft. high in parts, and is of brickwork, faced with picked stocks, and capped by a stone coping. We can scarcely imagine that any architect would advise such treatment to a building of stone; the difference in cost between this paltry brick wall and one of stone would be trifling, and yet the niggardliness and utter ignorance of even common sense has been allowed to prevail, the result being a lamentable disfigurement to the church, and a positive eyesore to every passenger. We do not know to whose individual influence this mode of treatment is due, but he or they deserve the warmest censure; and if the coping is to be left without an iron railing, the temptation as a vaulting wall will not be lost sight of by boys, and the close proximity of passing traffic combined, will, without doubt, add to the duties of the surgeons at King's College Hospital. It is nothing short of the duty of the ratepayers of the parish to take such steps as will lead to the wall being taken down and rebuilt with stone; and to prevent the inclosure being made a place of resort for boys, the wall should be capped by an ornamental iron railing of appropriate design.

W. W.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINAGE.

Sir,—From Mr. Guillaume's remarks at page 112, it would appear that he hardly catches the proper idea in connection with Professor Reynolds's plan, as said plan is not for "dealing with the gas generated in drains," but with the gas coming back from common sewer, to prevent which gas from common sewer getting into house drain, either a tile-pipe, syphon-trap, or a "trough," is put in, as shown at page 59, upon house drain as it passes from the house As a supplement to Mr. Reynolds's plan, Mr. Guillaume proposes one of his own, and says: "My plan, however, would provide a small trough at every discharge or closet, and a syphon-trap as well to each, thus doing away with the objection of 'Plumber' in your last issue." Now, to take up the last idea first: the plan of Mr. Guillaume, instead of "doing away with" my objection, supports it; more, he actually clinches it by going further than I went; for, whereas, at page 89, I only wished a syphon-trap to each closet, &c., he proposes a rider to that in the shape of a "small trough" also. Now, I cannot agree with that, because I consider a properly put in syphon-trap for each closet quite sufficient of itself without any additional "small trough;" more, I consider said additional "small trough," if put in, not only a waste of money, but it would do more harm than good. In short, it is not an extra small trough that is wanted here, but proper ventilation.

Mr. Guillaume refers to his remarks as given more at length at page 472, December 22, 1871, Vol. XXI. I may also refer to my own remarks in same month, and also in January following in Vol. XXII.—I am, &c.,

Plumber.

SCHOOL PLANNING COMPETITION.

Sir,—With reference to the instructions to competitors, I see there is no mention of a perspective view. Am I right in supposing this to be optional? And if a perspective view is furnished, is there any objection to its being on the same sheet as the geometrical drawings? Else I am afraid that a sheet of double elephant will be very barely covered. Then with regard to scale; might I venture to suggest that a scale of 12ft. to the inch is rather too minute for the proper representation of the sections and elevations; would not the almost universal eighth scale, or even the tenth scale, be preferable?

You state that a "general room" is required for each of the graded schools; is this to be fitted up with desks and benches for the full number (220), or only for those which will be in the school-room whilst the class-rooms are occupied? If it has to be fitted up for the full number, I should think the number of groups of desks must far exceed the number which the Committee of Council of Education fix as the limit—viz., 6. If so, a second room would be required, whilst you only mention one.

Are the requirements of the Metropolitan Building Act to be implicitly followed?

Your instructions say that "the land has a uniform fall of 3ft. from cross street, eastward, in its total length;" the plan shows the sewer as running from east to west, or so the arrows seem to denote. Is this correct?

As other intending competitors may, perhaps, be in doubt as to the points I have mentioned, might I ask the favour of a brief explanation in your next.—I am, &c.,

T.

[It is quite optional as to perspective view, but if made it must be drawn on the same sheet of double elephant. In our statement last week read "drawn" for "mounted" in the first line of third paragraph. It should be "The geometrical drawings are to be all drawn on one sheet."—Ed.]

Sir,—Your correspondent "H." has perverted and misconstrued my letter by breaking the sentences to suit his own purpose, and has adopted a tone of writing that is discourteous.

Any further discussion of the matter can lead to no profitable result, but if any of your readers are impressed with the value of the idea propounded by "H.," by all means let them try it, and if it proves successful, he will deserve thanks and credit for his suggestion.—I am, &c.,

T. P.

1, Westminster Chambers, Victoria-street, Westminster, S.W., August 10, 1872.

Sir,—I wish to know what accommodation is required for "care-taker's" residence? Also to what school—girl's or boy's—is the drawing class-room to be attached? or is it to be so arranged that both schools may have access to it?—I am, &c.,

F. B. V.

Sir,—In your instructions you speak of "double class-rooms;" this, I presume, means two class-rooms to each respective boys' and girls' school, capable of being respectively thrown into one. You also say "playground to be provided for the infants;" does this mean that playground is to be provided for the infants only, or is it to remind competitors to provide this playground as well as for the "graded schools?"—I am, &c.,

Intended Competitor.

[As possibly other inquiries in connection with this competition may reach us, we will endeavour to answer them all at the same time.—Ed.]

Intercommunication.

QUESTIONS.

[2627.]—**Template and Templet.**—Is there any difference between template and templet?—Stonework.

[2628.]—**Public Works in India.**—Where should one apply for appointment on public works (civil) in India?—X. X.

[2629.]—**Books.**—Could any correspondent of the Building News inform me of the published price of the four volumes of Stewart & Revett's "Antiquities of Athens"? Also, the best work on the details of staircases and general carpentry.—Junior Pupil.

[2630.]—**Competitions.**—Can any one enlighten me upon the following subject? Suppose there is a firm of architects, one of whom is on the School Board, and there is a school competition in connection with the said board, can the board legally employ one of the other members of the firm, supposing he is successful, and has competed entirely on his own account, the firm (as such) not having anything to do with the competition?—Wonder.

[2631.]—**Planning.**—A young carpenter is desirous of knowing an easy method or description of any instrument for getting the angles (in order to make a plan on paper) of the rooms of a house, most of which are filled with furniture, and therefore only the measurement round by the walls is possible. The four sides are of unequal lengths, and none at right angles.—A Young Carpenter.

REPLIES.

[2609.]—**Plaster.**—Salt in sea-sand is said to show itself in a white efflorescence on the surface of the wall; but this is not always the case, as in some instances the salt, not being in very large proportion, becomes decomposed by other compounds present in the mortar. A better and more decisive test than that given on p. 91 is afforded by nitrate of silver or lunar caustic. Take a small portion of sand, and pour over it, in a clean vessel, rather more rain-water (or, preferably, distilled water) than is sufficient to cover it. Shake the sand and water for a few minutes, then allow the sand to subside, and having poured off the clear liquid, add thereto a few drops of the test solution (made by dissolving 6 or 8 grains of nitrate of silver in an ounce of rain or distilled water). If salt is present, the liquid from the sand will become milky, and if in large quantity, a white curdy precipitate will soon collect at the bottom of the vessel. The solution of nitrate of silver should be kept in the dark, or it will become discoloured through the sun's rays decomposing it. Neither must the hands be smeared with it, as it blackens the skin.—E. E. H.

[2609.]—**Plaster.**—In reply to "R. F.," I think that in the case he mentions, if fair time was allowed to elapse between plastering and painting, the lias plaster would throw off the salt in the natural process of sweating, and when once thoroughly set would not again be affected by damp weather. Lias plaster is in all cases dangerous and difficult to use, but when once properly set is as hard as Portland cement stucco. If in lieu of lias "R. F." were to use white chalk lime with sea-sand impregnated with salt, he would never get more than a surface-set, especially if his house is situated in a damp neighbourhood. For use under paper, even with lias, I should strongly recommend "R. F." to wash his sea-sand in spring-water.—Gilbert R. Redgrave.

[2619.]—**Lighting Interiors.**—The proportion of 1 foot superficial of window space to every 50 or 60 cubic feet of room makes a light and cheerful abode.—J. T. J.

[2620.]—**Slating Towers.**—I agree with "One of a Trade" that the practice of putting the lead of hips or ribs of spires under the slates is a bad one. To me it appears to be simply an oddity originating in a desire to be uncommon. It gives an appearance of tameness to the spire that is anything but improving.—P.

[2620.]—**Slating Towers.**—The manner your correspondent describes the lead has been laid on the hips of the Guildhall tower may appear strange to him, as we all well know how lead has been laid and is still done on all rubbish of modern work, where if you turned up the lead the slates would be found to be a distance of 4in. to 5in. off from the hip at tail, and at the head probably 1½in., which no architect or builder should ever tolerate. When the hips are closed up in the manner stated, then all is visible and nothing scamped. It is very refreshing to learn from week to week that old monster shamistic-compo-and-rococo-style has almost died a natural death. If a work is worth doing, let us do it well, or not at all.—An Old Cornish Slater.

[2621.]—**Oblique Arches and Skew Bridges.**—Your correspondent J. Carlton will find the necessary information in "A Practical Treatise on the Construction of Oblique Arches," by John Hart, mason.—T. E. W.

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WATER SUPPLY AND SANITARY MATTERS.

Edinburgh.—During the last few days Mr. Hawkesley, C.E., has been engaged, with Mr. Leslie, Consulting Engineer to the Edinburgh Water Trust, in examining the various sources within easy reach of Edinburgh, from which an additional supply of water can be obtained. Last week a day was devoted to the Pentland Hills, another to the river Lyne, and a third to the Moorfoot Hills, and this week the Lyne was revisited. The object is to prepare a report which may form the basis of legislation in next session of Parliament.

Taunton Drainage Works.—A public meeting was held in Taunton on the 8th inst., convened by the Government Inspector (Mr. Arnold Taylor), to take into consideration the necessity and desirability of borrowing £4,000 to complete the sewerage of the district. The scheme proposed consists of bringing the whole of the sewage to one outfall in the Sarget field about half a mile from the town, so that at some future time the sewage may be deodorised and utilised, a scheme for which is under the consideration of the Board. The proposed arrangement will necessitate the bringing the sewage of the northern part of the town under the river Tone by means of an iron syphon, with a depression of about 3ft. There will also be another iron syphon under the mill stream in Sangier, with a depression of 1½ft. Also all the closets and drains that empty their filth into the river are to be destroyed. The plans of the joint schemes were prepared by, and the works are to be carried out under the superintendence of, Mr. J. H. Smith, the Board's surveyor.

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In Re Edward Vigers.—The debtor was a builder, brickmaker, and dealer in land, carrying on business at Elgin Lodge, Harrow-road. He recently filed a petition for liquidation, with liabilities of about £80,000, and at the first meeting the creditors passed a resolution accepting payment in full of their claims by four equal instalments in June and three following months of the year 1875. At the instance of Messrs. Thompson & Smith, a debtor's summons had been issued with a view to bankruptcy, and they had also raised an objection to the registration of the resolution.—Mr. R. Griffiths, on Monday mentioned the case to the Court, and asked that an injunction restraining proceedings under the debtor's summons should be continued until after the question as to the registration had been determined and the adjourned first meeting held.—His Honour said that the order adjourning the application from a former day did not appear to have been drawn up, and there was no knowing whether the other side would attend.—Mr. Griffiths said that of creditors whose claims amounted to £21,000 who attended the meeting, those to the extent of £20,000 were assenting parties to the arrangement.—His Honour declined, however, in the absence of any formal order, to extend the injunction, but gave leave to serve short notice of motion for Wednesday, an interim injunction being granted in the meantime.—On Wednesday the case again came before Mr. Registrar Murray. His Honour decided that he could only restrain proceedings after the petition in bankruptcy was presented by creditors proceeding on the debtor's summons if so advised.

Our Office Table.

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A Solvent "Bankruptcy."—A large meeting of the creditors of Edward Vigers, of Harrow-road, builder, was held at the Cannon-street Hotel, London, last week. A statement of the affairs showed a surplus of £44,000, after paying 20s. in the pound. The proposal to pay 20s. in the pound, together with 5 per cent. interest, in four instalments of 5s. each—the first instalment payable in June 1875, the remainder in the three following months—was accepted almost unanimously, and a committee of five creditors was chosen to see the terms of the offer carried out.

Annual Treat to Messrs. Maw's Workpeople.—The usual annual treat to the workpeople employed at the Benthall Encaustic and Tesselated Tile Works took place on Monday week, at Severn House, the residence of Mr. A. Maw. The day is usually marked by a procession, a dinner, tea, and supper, with out-door amusements; but the weather in this instance interfered sadly with the arrangements.

Novel Wood Sawing Machines.—A new application of a well-known fact has recently been patented in America. Many persons know that when an electric current is transmitted through a fine platinum wire, the wire becomes red hot. The patent in question is for the utilising of this principle for the purpose of cutting wood. Hence we may now have the sawing of timber effected without a saw. Dr. Robinson, the patentee, was led to this novel application of electricity by observing the facility with which a platinum wire, when raised to a white heat, effected the removal of tumours, and cut its way into the living flesh. It is anticipated that by means of this invention, which requires only a simple quantity battery, trees will be felled and divided into logs, and other operations of a similar nature performed.

Damage from the Late Storms.—The Metropolitan Board of Works had under their consideration on Friday last a number of letters from different parts of the metropolis, complaining of the flooding of houses caused by the late storms, and asking for some compensation for injuries alleged to have been sustained. The Board in every instance declined to admit their liability; but with respect to the Fleet Sewer, which now appears to be insufficient to carry off the drainage from the largely increased neighbourhoods built on its upper banks, the Board have determined that a new subsidiary sewer shall be constructed about two months hence, at a cost of £70,000.

The New Act Regulating Arbitration.—On Friday last the Act to make further provision for arbitration between master and servants (35 and 36 Vic., cap. 46) was issued. It recites the Act, 5 Geo. IV., cap. 96, in which provision was made for the arbitration, in a mode therein prescribed, of certain disputes between masters and workmen. Provisions are now made with reference to agreements under the Act. An agreement is to designate some Board, Council, or persons, as arbitrators. A master and a workman to become mutually bound by an agreement upon the master or his agent giving to the workman, and the workman accepting, a printed copy of the agreement. A workman may, within 48 hours after the delivery to him of the agreement, give notice to the master that he will not be bound by the agreement, and thereupon the agreement is to be of no effect as between such workman and the master. There are other regulations to facilitate arbitrations between masters and workmen.

Destruction of Old Remains at Northampton.—The Northampton Station of the recently-opened Bedford and Northampton Railway occupies the site of the gardens of the ancient Hospital of S. John, the building itself being erected on the very spot where once stood the house in which dwelt the master of the famous Order. Archæologists may mourn the destruction of this relic of a feudal period, but it was fast becoming a shapeless mass, and the larger portion of it had been used for years as a timber store. The ancient chapel and almshouses which remain are the property of the contractors, Messrs. Edwin Clark, Punchard, & Co., who, having been compelled to purchase them, are likely to utilise them for commercial purposes, unless the interposition of public spirit saves them from their impending degradation.

Damp in Walls.—A new preparation for effectually preventing and curing damp in walls has just been introduced into this country by Mr. Viard Muller, of Paris and Hackney. The peculiar property said to be possessed by this composition is that the greater the amount of damp with which it comes in contact the quicker and harder it dries, therefore a fresh plastered wall may be made ready for papering as fast as the liquid can be put on. We had an opportunity of seeing it applied to a wall, which must have subjected it to a very severe test, and it seemed satisfactorily to carry out its appropriate title of "Instanter Enamel."

Foundations for a Monster Steam Hammer.—In preparing the foundations for the anvil of the new 25-ton Nasmyth steam-hammer, at the Royal Gun Factories, Woolwich Arsenal, it was necessary to excavate a hole 45ft. square and 19ft. deep, and from the marshy nature of the ground upon which the whole structure will stand, it was found expedient to drive one hundred piles a foot square into the solid gravel about 25ft. below, the intervening spaces being filled in with concrete. On this was placed an iron plate 11in. thick and 30ft. square, weighing 164 tons. Upon this were put two layers of oak baulks, each 12in. deep. On this, again, was laid another iron plate, 10in. thick and 27ft. square, weighing 121 tons. Again, upon this were placed vertically oak baulks 2ft. 3in. deep, or in a square of 24ft., the whole being bound together with one wrought-iron band. On this rest two iron plates, each 12in. thick, having a total weight of 214 tons. The anvil was placed on this mass of wood and iron. Its depth is 42in.; in shape it is the frustrum of a cone, and it weighs 102 tons. Upon the top of this comes, lastly, the anvil face, weighing 60 tons, and having a diameter of 12ft. This is on a level with the ground floor of the forge. The remaining gape in this hole of 45ft. square being filled in with concrete binds all into one solid mass. Above this will be suspended the powerful hammer, which will strike with a force equal to 700 or 800 tons, and will be the largest hammer yet in use.

Screening Coals.—Apropos to the coal famine "A Colliery Agent" writes:—About 10 per cent. of our coal supply is lost to consumers by the ridiculous practice of screening in London. Once a fire is lighted small coal is quite as good as large, if not better. All necessary screening is done at the pit's mouth; and to re-screen coal in London is sheer waste, brought about by the fastidiousness of the public. In this way not less than 700,000 tons are annually sacrificed in the metropolis—in other words, this large quantity is needlessly withdrawn from our available supplies, and rendered comparatively worthless.

Concrete Buildings and the Building Act.—At the last meeting of the Metropolitan Board of Works, Mr. C. Stuart Barker, Chairman of the Building Act Committee, brought up a report from the committee in which it was recommended that the application of Mr. Philip Brannon, on behalf of Mr. J. R. Bell, for approval by the Board of a special mode of constructing monolithic fireproof buildings proposed to be erected on land near Islington-green, be granted, on condition that the concrete used in the construction be compounded according to the conditions of the form of license submitted, and further recommending that the said form of license, which has been prepared by the Superintending Architect, and is a modification of the form approved by the Board on the 19th of June, 1868 (No. 11), be approved by the Board, and issued to the applicant accordingly. With reference to the two cases now before the Committee, of the erection by Messrs. Tall & Co., of buildings in East-street, Bermondsey, and Overhill-road, Dulwich, with walls of Portland cement concrete, without having obtained the license of the Board for the use of that material, the Committee recommended that Messrs. Tall & Co. be not pressed to accept a license for the buildings erected under their patent; and further recommending that a printed circular be forwarded to the district surveyors, informing them that the Board consider the buildings under this patent to be within the rules of the Building Act, and that they will be expected to take proceedings in the usual way in cases where the provisions of the Act are contravened.

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CHIPS.

New schools were opened at Stiperstones, Salop, on Wednesday week. The building is intended to accommodate about 200 children, and has been erected at a cost of about £950. Mr. Richard Parry, of Grimmer, acted as architect, and the work has been carried out by Messrs. Price & Blakemore, of Worthen.

Referring to the rumour which has been quoted in the daily press, from a musical contemporary, to the effect that her Majesty's Opera House, in the Haymarket, had been tried by some eminent singers and considered to be of doubtful fitness for Italian opera, Messrs. Lee, Sons, & Pain, architects to the building, state that no such trial has taken place, and that the fact of the theatre remaining closed is not due to any defect in its construction.

Mr. Geo. Gilbert Scott was knighted on Friday last.

A pulpit is to be erected in the nave of Exeter Cathedral to the memory of the late Bishop Patteson. The pulpit will be erected after a design by Sir Gilbert Scott, and will be composed of Devonshire marble, with marble statuettes. In addition to the statue of Bishop Patteson, figures will be erected on the pulpit of S. Steven, S. Alban, and S. Boniface. S. Boniface, the Apostle of Germany, was born at Crediton, and educated at the Benedictine Monastery in Exeter.

A slate quarry is about to be opened at Barrow-Head, Wigtonshire, N.B.

New schools have been opened at Stoke Prior. The building is from designs by Mr. M. Bohill. It is of the Gothic style of architecture, and the lecture room is 90ft. by 36ft.; class room, 36ft.; infants' school, 26ft. by 21ft.; height to the wall-plate, 16ft.; the roof (an open one, stained and varnished), rising 21ft. to the ridge, with an ornamented bell tower in the centre, and a tower over the front porch. The large room can be divided, so as to form two school-rooms. The playground is 180ft. by 150ft., and the school will accommodate 800 children, with residence for schoolmaster and schoolmistress.

Hurst-street Chapel, Birmingham, has been reopened after decoration by Messrs. Camm Bros., of Smethwick, at a cost of £160.

On Friday last the new workhouse which has been erected on a site at Crossland Moor for the Huddersfield Poor Law Union was opened. The foundation-stone was laid on the 7th of July, 1869, and the works have been carried on under the superintendence of Messrs. J. Kirk & Sons, architects, Huddersfield and Dewsbury, at a cost of £24,000.

A new Parochial Institution is being erected in George-street, Oxford-street, for the parish church of Saint Mark, North Audley-street, from designs by Mr. Withers, architect; it will comprise industrial and soup kitchens, workmen's club, mission room, parish and committee rooms, model lodgings for parish officers, art school, &c. The front next George-street will be of red bricks and will be six stories high. Messrs. M. Allen & Son, have the contract for £4,483. Mr. Laidler is clerk of works. The Marquis of Westminster gives the site.

Dr. Rossell, the keeper of the State Archives, who has just died at Wiesbaden, had acquired a wide-spread reputation through his archæological researches, especially in connection with the archælogy and topography of the Rhine and its neighbourhood.

The long-promised volume by Mr. Drury Fortnum, on the majolica in the South Kensington Museum, approaches completion.

The Rev. Dr. J. Griffith, late one of the Canons of Rochester Cathedral, has marked his retirement from the canonry by presenting £3,000 towards the restoration of the Cathedral, which is now being carried out under Sir G. G. Scott.

A swimming bath for women is to be established in connection with the Marylebone baths and wash-houses.

Belfast intends to ask the British Association for the Advancement of Science to choose that town for its meeting for 1874.

Mr. W. Gibbs, of Tyntesfield, Bristol, has given £1,000 to the restoration fund of Bristol Cathedral.

The ancient church of S. Michael, Warwick (which is now used as a blacksmith's shop!), is to be restored, as a testimonial to the vicar, who has served for the long period of sixty years.

S. George's Church, Bolton, was reopened on Sunday last, after redecoration by Mr. Heyes, of S. George's-road.

The corner stone of a new Licensed Victuallers' Asylum for Exeter was laid last week. The buildings will be in the Gothic style, and the external walls will be of brick, with bath stone dressings. Mr. A. H. Wills, of Topsham-road, is the architect, and Mr. J. Slade, of Bonhay-road, the contractor.

A new church for 250 persons was opened on the 30th ult. in the hamlet of Charlton, in the parish of Cropthorne, Worcestershire. We read in a local paper that "Mr. Workman, formerly Mayor of Evesham, having purchased the manor of Charlton, and wishing to provide for the spiritual wants of his immediate neighbours, removed a barn from one of his farms and re-erected it on a suitable site as a chapel, adding to it a porch and windows, in the Decorated style. In doing this he was his own architect, aided by Mr. Forsyth, sculptor." The chancel windows are filled with stained glass by Ward & Hughes.

Melchet Court, near Romsey, Lady Ashburton's seat, has been almost totally destroyed by fire. The mansion was quite modern, having been completed but a few years ago, the architect being Mr. Clutton, and the style Elizabethan. Fortunately nearly the whole of the art treasures with which the place was stocked were saved with but little damage.

The United Presbyterian Church of Kilbarchan is undergoing extensive repairs and alterations, at a cost of nearly £1,000.

Trade News.

GATESHEAD.—On Monday, in accordance with notice given by the joiners of Newcastle and Gateshead, the men struck at the whole of the shops in the two towns where their demand for an advance of 2s. per week had not been conceded, except at Messrs. Lowrey's. In the evening a meeting of the men was held, and also a meeting of the masters. After discussing the position of affairs for some time, a deputation from the men's meeting waited upon the employers, and a long conference ensued, at the termination of which nothing definite was settled.

LIVERPOOL.—At a meeting of the Liverpool Operative House Painters, on the 7th inst., it was unanimously resolved to memorialise the masters for an advance of 1d. per hour on their present rate of wages, six months' notice to be given from the 1st October next. It was further resolved to memorialise the employers to adopt the nine hours' system. During the meeting a resolution was passed suggesting that all painters who did not belong to either of the existing societies should immediately enrol themselves as members.

LONDON.—Matters connected with the strike continue as they were. On Wednesday several of the Carpenters' and Joiners' Central Committee were engaged in making district visits to ascertain the real views of the men upon the desirability of again approaching the employers with a view of terminating the strike. Generally they found the weight of opinion was decidedly favourable to such a step, and the Central Committee are hopeful of being able to obtain the sanction of a majority of the Nine Hours' Delegation to a renewal of overtures to attempt an immediate settlement of the dispute. They assembled on Thursday morning to decide upon their final course of action, and to draw up the resolutions to be submitted to the delegates in the evening. A meeting was also convened for last evening of builders' foremen and clerks, "to consider whether some mode for settling the present dispute in the building trade can be recommended." The decision, however, of the delegates upon the main question may have rendered any recommendation from that friendly quarter unnecessary. Messrs. Benny & Burgess, the Lancashire deputation, have been directed to wind up the engagements and return to town.

MANCHESTER.—The masons in Manchester have been agitating for a considerable time to commence work at 7 o'clock in the morning, and an advance of wages from 7½d. to 8d. per hour. Last Tuesday they gave notice that if the demand was not conceded they would strike on Thursday morning, giving two days' notice. A conference took place between the operatives and employers on Wednesday afternoon, and, after a long discussion, it was agreed that on the 1st of March, 1873, work should commence at 7 o'clock in the morning, working 49½ hours per week, and the wages to be advanced from 7½d. to 8d. per hour.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled, Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

BROMLEY.—For the erection of schools in Mary-street, Bromley, for the School Board of London. Mr. Lacy W. Ridge, architect. Quantities supplied by Mr. L. C. Riddett:—

Nixon & Son	£6700
Sheffield	6500
Brass	6359
Higgs	6350
Killby	6183
Williams & Son	6117
Scrivener & White	5745
Cooke & Green	5698
Nightingale	5578

IRELAND.—For the erection of Town Hall, Holywood, County Down, Ireland. Mr. Wm. Batt, jun., architect:—

Nimick (accepted)	£1580

IRELAND.—For additions and alterations to Glebe House, Holywood, County Down, Ireland. Mr. Wm. Batt, jun., architect:—

Colville	£1795
J. & J. Gailer	1600
Lowry & Son	1540
Moore	1470
Rowley & Mansell	1450
J. & R. Thompson	1300
Nimick (accepted)	1248
Moore & Son	1215

LONDON.—For taking down and rebuilding Nos. 13 and 14, Upper Berkeley-street, Portman-square, for Mr. W. H. Hudson. Mr. Alfred Wright, architect. Quantities supplied:—

Sharpington & Cole	£2929
Brown	2840
Temple & Forster	2675
Harris & Son	2659

MARLOES.—For the erection of new school buildings and teachers' residence at Marloes, Pembrokeshire (wall-stone and haulage not included). Mr. E. H. Lingen Barker, architect:—

Davies & Parton	£760 0 0
J. Davies	723 19 4
Morgan	677 9 0
Lewis	675 10 0
Edwards	670 0 0

NORTH END.—For alterations to S. John's Lodge, for Mr. G. Drew. Mr. R. A. Came, architect:—

Pitts	£404 3 0
Furrell (accepted)	320 0 0

ROMSEY.—For new class-rooms and superintendent's house at Romsey Abbey Chapel. Mr. H. J. Paull, architect. No quantities:—

Fry	£1144 11 4
Read	1086 0 0
Spackman	978 0 0
Crook (accepted)	900 0 0

ROYSTON.—For the erection of new brewery, maltings and stables, near Royston. Mr. George Scamell, Great George-street, Westminster, architect. Quantities by Messrs. Curtis & Sons:—

Coles Brothers	£10550
Bell	9830
Dove Brothers	9275
Brown (accepted)	9160

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Do.	do.	12 by 7	...	1 18 6	13s.
Do.	do.	12 by 6	...	1 7 6	11s.

Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to

MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

CITY OF LONDON, September 5.—For designs and tenders for the execution of a medal, to be struck as a memorial of the late National Demonstration on the visit of Her Majesty to the City on the Thanksgiving Day.—Woodthorpe, Guildhall.

GRAYS THURROCK (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

OBAN, September 12.—For designs for a new church. A premium of £25 will be given for the most suitable design.—Mr. James Nichol, Banker, Oban.

SUNDERLAND SCHOOL BOARD, September 2.—For plans and elevations for school buildings to be erected in James Williams-street. Premiums of £20 for the best, £10 for the second best, and £5 for the third best designs.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BROWNHILLS (near Walsall), September 14.—For the erection of a police-station and cells.—Mr. R. Griffiths, Architect, Martin-street, Stafford.

CANTERBURY, September 2.—For proposals from persons or companies willing to accept a concession of sewage for a term of years.—Mr. R. W. Flint, Clerk to the Local Board, Canterbury.

CASTLISLAND RAILWAY COMPANY, September 28.—For the construction of the proposed line from Gortalea to Castlisland.—Messrs. Cotton & Fleming, 3, Harcourt-place, Dublin.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 23, 1872.

THE FAILURES OF THE MIDDLE AGES.

If prosecutions for heresy were not happily unknown in the art-world, our subject is one that might be dangerous to meddle with. The successes of the Middle Ages, their glorious achievements and splendid victories, are the theme of universal praise; and to speak of them with enthusiasm has become the road to architectural repute. Undoubtedly, too, they deserve the praise they receive. We have not a word to say by way of depreciating the real excellences of Mediæval work, many of which by no means lie on the surface, but only disclose themselves by degrees to patient and loving observation. What we seek is to render this admiration more discriminating; to make it remembered that we of the nineteenth century are men, and that they of the thirteenth were no more; and to show that we shall honour them most, not by abasing our intellect and renouncing our judgment in their presence, but by wisely awarding to each of their performances the more or less of praise which is its proper due. For once, then, and by way of exception to what is deservedly the ordinary practice, we may note a few of the cases in which the Middle-Age builders did not succeed. These cases may be accounted for in a number of different ways. The first and most obvious way is to consider that, six hundred years ago, genius was as rare as now, and stupidity as common. A vast quantity of work, especially in villages, must have been designed by men of no particular ability: mere country masons and carpenters, whose highest merit was only the absence of affectation. To us, in this self-conscious age, when every one builds as if all the world was looking at him, and poises and postures himself accordingly, this unaffectedness has a wonderful charm. Brought up and educated amongst all that is artificial, to be natural seems to us the highest art; a thing that has to be learnt by the laborious effort of half a lifetime. To our ancestors, it was the only course to be conceived of. They arranged their buildings to please themselves, and, never taking any pains to please other people, contrived to do it in the most effectual way. When, for example, they set about a village church, they do not seem, as a rule, to have started with the intention of making it the finest church in the neighbourhood, nor even the most showy they could put up for the money. They planned in a rather matter-of-fact style, putting an aisle here and a chapel there as they happened to be wanted, and so they proceeded throughout the building. Anything noticeable in the way of detail was often, though not always, derived from more important works—from the *architecture* of the time, and not from the invention of these very unassuming builders. Their work, in a large number of cases, is no more to be called architecture than their daily speech, if written down, could have been called literature. The most that can be said of either one or the other is that it answers the purpose; that there is no nonsense about it, and no vulgarity. It contrasts as favourably with the pretentious low-class building of to-day as the dialect of a north country labourer does with that of a London costermonger, and the pleasantness of the contrast has led to its being considerably over-rated. But it is not art, though it has some elements of art in it. The artist must arise and deal with it before it merits that designation. It may be the raw material on which he can work; but it is as great a feat to transform into architecture the rude building style of country masons as it was for Burns to transform into poetry the rude dialect of Scottish peasants.

Very much, then, of the Mediæval work which remains in rural districts cannot be set before the student of to-day as a model for direct imitation. It cannot be put forward as a standard for a civilised age, though its merits, as civilisation advances, grow rarer and more precious; and though its faults are far less offensive than those in 90 per cent. of our recent street architecture. So the "Northern Farmer" of the old style, in spite of his rough ways and uncouth language, is a far more bearable personage than his would-be "genteel" successor; but educated people are no more likely to take the one than the other as a pattern of manners and conversation. Considered as architecture, then, we think that much of this rural work may be called a failure, and the more important its object, the more of a failure it becomes. Common language, indeed, answers admirably for common purposes, and a very limited vocabulary will suffice to express the wants of daily life. So it is in the sphere of architecture. The rural mason, as long as he had but a house or a cottage to deal with, was master of his business, and did it well. Such subjects need little beyond direct and unaffected treatment, and this they were sure of receiving at his hands. It was otherwise when he overstepped the narrow limits of his knowledge and his capacity; and many a church which most of us are trying hard to admire is only a futile attempt at the poetry of art by one who was capable of no more than the driest prose. Our old village churches might, in fact, be easily divided into two classes—those by architects, and those by country builders; the former, though not more pretentious, are infinitely more refined than the latter, and mark themselves plainly as the products of cultured and thoughtful minds. Such an example, for instance, as Stone Church, Kent, which Mr. Street conjectures to have been the work of the thirteenth century architect of Westminster Abbey, stands out conspicuously amongst a crowd of ordinary productions. It is, as far as it belongs to the Early English period, a work of art, as distinguished from a mere unaffected specimen of ordinary building, and exhibits a type which is both higher and more appropriate to our times than that of the average rural mason of the Middle Ages.

Those centuries, however, comprise failures of a kind quite different from and more interesting than the falls of an unduly elevated ambition. The latter class may, indeed, teach us caution and humility, but the former may inspire us with hope. In each period of transition, especially, we may still trace many vain efforts after perfection, many attempts to solve the problems which, as it proved, were not to be solved as yet. The development of the cross-vault affords one well-known series of such failures: that of the buttress another. The study of these experiments is far from fruitless; it shows us that those who, as we gaze on them through the mist of ages, seem to have the stature of demigods, were after all no greater than onrselves. They rose by toilsome climbing, by many steps and with many falls, to the height which they finally attained, and we may rise as they did if we only dare. No feeling can possibly be more alien to that of the Mediæval builders than the reverence for precedent which distinguishes so many of their modern admirers. The Pointed style only came into being when the last vestige of precedent was cast aside, and every one of the phases through which it passed involved the deliberate rejection of much that had gone before. To set aside precedent, however, to strike out a new path, and work out a new series of ideas, necessarily involves risk. "Nothing venture, nothing have," holds good in art as in everything else, and those who are cautious enough to avoid conspicuous blunders lack the daring which leads to distinguished success. In this sense, Mediæval art emerged from a succession of failures, and without their aid its most glorious accomplishments could never have been achieved.

There remains one other class of failures, and this, perhaps, the most suggestive of all. It comprises the schemes which were attempted and never completed; the promising ideas which after only one or two trials were, for some cause or other, abandoned; the possible successes which were never rendered actual. Here it is in our power to continue the search, and carry off the prize. The unsuccessful attempts of the past show us how it is *not* to be reached; we need not spend our labour in searching for it in this or that direction. All this narrows the issue and lessens the risk; so many of the necessary failures have been gone through in the past: so much the fewer remain for us to go through now. A familiar example of this class—one which has lately been brought under discussion by Mr. Scott—is the introduction of the dome into Gothic architecture. Attempts at it have been made ever since Gothic architecture existed, and some of them are palpably among its failures. The Church of S. Anthony at Padua, for instance, is a conspicuous illustration of "how not to do it," and there are more elsewhere. Our own magnificent octagon at Ely is only half a success; internally the feat is accomplished, externally it has scarcely been attempted. The Romanesque churches on the Rhine come pretty near to it, but then Romanesque is only half-developed Gothic. The French Byzantine buildings came nearer still; but pointed arches do not make up the Pointed style, and here its other details are absent. The Saracenic buildings of Cairo and its neighbourhood, perhaps, come nearest of all, at least in their internal composition, but they only give few and scattered hints about the design of domes in a style based on buttress construction. We have warnings enough, and encouragements enough; there are suggestions and tantalising half-realisations on every hand, but perfection nowhere. It remains for us to mark them all and learn from them all; then, putting them all together, to risk the few more failures that may interpose between us and the greatest art success which the world has ever seen.

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NOTES ON EARTHWORK.—XIV.

Mr. CHARLES TOMLINSON, in his "Cyclopædia of Useful Arts," quotes, apparently from a paper read before the Royal Society of Edinburgh, an interesting description of a descent in a diving-bell by Mr. Bald, at Howth Harbour, near Dublin. The light they had in going down was very strong, so that they could distinguish a great number of fishes and other marine animals, and they could read and write easily. That part of the bottom which was not rock consisted of sand and pebbles. The current was very violent; the colour of the water, as seen through the bull's-eye lights, was a light green. The temperature of the air before going down, and inside the bell, was 63 deg. of Fahrenheits's thermometer, but the temperature of the water at the bottom, about 20ft. below the surface, was only 56 deg. They had 10in. or 12in. of water in the bell. The signals made use of by the workmen are very simple; they consist of strokes with a hammer against the sides of the bell. They are easily heard in the boat above, though no noise made above reaches the bell below. The compass points, north and south, are marked on the ends of the bell, by which the men in the bell regulate their movements in communicating with those above. The signals for the various movements are as follow:—1 stroke means more air; 2, stand fast; 3, hoist; 4, lower; 5, move south; 6, north; 7, front; 8, back; 9, lower down the bucket; 10, hoist up the loaded bucket. It is by these signals that the bell is moved about in search of stones. This is effected by raising the bell a few feet from the bottom, and then, by aid of the moorings of the vessel, the bell sweeps along in any required direction: as soon as a large stone is discovered the signal is made, the horizontal movement is stopped, and the bell lowered over the stone. If the bell be a little aside the workmen can, by standing on the bottom of the sea and pressing with their shoulders against the bell, make it swing a foot or two in any direction. The men at Howth were principally occupied in clearing the entrance to the harbour. They were paid by the ton weight for what they sent up—viz., 6s. 6d. per ton for very hard rock that has to be chiefly blasted with powder, 5s. 6d. for easier rock, and 4s. per ton for detached stone, gravel, and mud. At these rates they earned 20s. per week all the year round.

The quantity of rock they excavated averaged 3½ tons per day, and detached stones, gravel, and mud, 5½ tons, for four men. The method of blowing up the rocks was as follows:—Three men are employed in the bell; one holds the jumper or drill, and the other two strike with hammers in succession. When the hole is bored of the requisite depth a tin cartridge about 1ft. in length and 2in. in diameter, filled with powder, is inserted, and sand placed above it. To the top of the cartridge a tin pipe is soldered, having a brass screw at the upper end. The diving-bell is then raised up slowly, and additional tin pipes with brass screws are attached, until the pipes reach to a height about 2ft. above the surface of the water. The man who is to fire the charge takes a boat close to the tube and attaches a cord to it, which he holds in his left hand. Having in the boat a chaffer with small bits of iron red hot in it, he, with a pair of nippers, takes one of the bits of hot iron and drops it down the tube, which instantly ignites the powder and blows up the rock. A small part of the tube next the cartridge is destroyed, but the greater part, which is held by the cord, is reserved for future use. The workmen in the boat experience no shock by the explosion; the only effect is a violent eruptive ebullition of the water, arising from the explosion. A certain depth of water is necessary for safety, probably about 12ft.

The lighter particles of earth swept down into rivers and estuaries, amongst which are many particles of organic matter, are held suspended in the water until its current is checked and it remains still for a sufficient length of time to allow them to be deposited on the bottom. This deposit is called silt, and it may be removed in two ways different to any we have hitherto described. It may be pumped up through pipes in water and carried by water troughs or shoots after it has been raised to a few feet above its intended point of delivery, as has been done, according to Mr. David Stevenson's "Canal and River Engineering," at the New Amsterdam Canal, now being constructed under the directions of Mr. Hawkshaw, by means of a Woodford's revolving pump, after which it is conveyed along wooden pipes floated on the water to its place of deposit outside the banks.

A similar method was adopted in excavating part of the Suez Canal, where the sand was raised by excavating machines into inclined troughs, with water sufficient to carry the sand along them to the banks. This method, however, is different to that of excavating by the "sand pump," to be mentioned in the next article. The slope of the trough, to give a sufficient velocity to the water to carry with it solid particles of various degrees of fineness, may be calculated on the basis of the observations made by Du Buat, that a velocity at the bottom of a channel of 15ft. per minute carries along soft clay, or silt, or river mud; that 30ft. per minute carries along fine sand; 45ft. per minute, coarse sand and gravel of the size of peas; and 60ft. per minute, gravel of the size of beans.

These are the bottom velocities in the respective cases. In respect of the velocity of the surface water and of the mean of the whole body, Professor Rankine says, in his "Manual of Civil Engineering," that "inasmuch as every stream of fluid that flows in a channel is retarded by friction against the material of the channel, the velocity of the fluid particles is different at different points of the same cross-section, being greatest in the centre and least at the border. In open channels, like those of rivers, the ratio of the mean velocity to the greatest or central velocity is given approximately by the formula of Prony," that the mean velocity divided by the greatest velocity is equal to the greatest velocity plus 7·71ft. per second, divided by the greatest velocity plus 10·28ft. per second.

"The least velocity, or that of the particles in contact with the bed, is about as much less than the mean velocity as the greatest velocity is greater than the mean. In ordinary cases, the least, mean, and greatest velocities may be taken as bearing to each other nearly the proportions of 3, 4, and 5. In very slow currents they are nearly as 2, 3, and 4." So that to ensure a bottom velocity of 15ft. per minute the inclination of the trough or channel must be such, combined with the hydraulic mean depth of the water, as will give a mean velocity of about 22ft. per minute; of 30ft., 45ft.; of 45ft., 67ft.; or of 60ft., 90ft. per minute mean velocity; and the velocity observed at the surface with a float should be, to ensure a bottom velocity of 15ft., 30ft. per minute; of 30ft., 60ft.; of 45ft., 90ft.; or of 60ft., 120ft. per minute. These are supposed to be the very least velocities that will keep in motion solid particles of the various degrees of fineness stated.

Eytelwein, in his book on "Hydraulics," gives the relations which the several properties of velocity, inclination, and hydraulic mean depth bear to each other as being

$$v = \cdot 9 \sqrt{h f},$$

when v = the mean velocity per second,
h = the hydraulic mean depth, and
f = the fall in two miles.

f, therefore, $= \dfrac{v^2}{\cdot 81\ h}$; $h = \dfrac{v^2}{\cdot 81\ f}$; and $v^2 = \cdot 81\ h f$.

To take an example, if a trough or channel be, say, 88 yards in length, it would be the one-fortieth part of 2 miles, and if it had 1ft. fall in that length it would have, if extended so far, 40ft. fall in the 2 miles. If the hydraulic mean depth were 1ft., the mean velocity would be 5·7ft. per second, nearly, for

$$f = 40,\ h = 1, \text{ and } \cdot 81 \times 40 \times 1 = 32\cdot 4,$$

the square root of which is 5·7 nearly. This being the mean velocity, the bottom velocity would be (3 : 2 : : 5·7 :) 3·8ft. per second, which is sufficient to move rough gravel along the bottom of the channel, if it be smooth, as in a wooden trunk.

Another method of moving silt or sand is by sluicing. When the late Mr. Rendel designed the Birkenhead Docks he estimated—according to a paper read at the Institution of Civil Engineers by Mr. Ellacot—that a deposit would take place in the low water basin of a tenth of an inch in depth in 24 hours, and this estimate was subsequently well borne out by observations which made the actual deposit ⅞in. per week. Mr. Rendel so arranged his sluices commanding the pent-up water of Wallasey pool as to cause a current through the basin of 2¼ miles an hour, a velocity which he estimated to be sufficient to remove the deposit, or rather to prevent its accumulation.

The excavation of ground for foundations of river walls, bridge abutments, and piers, is performed in several different ways, the more usual one being by means of coffer-dams, within which the bottom can be laid dry and the ground excavated by manual labour. A coffer-dam usually consists of a double row of close piling 6ft. apart in the clear, although the width is sometimes greater, as at Grimsby, to be mentioned presently, and at Liverpool, and sometimes less, as at Hull, where Mr. Hawkshaw, in lengthening the Victoria Dock, constructed a coffer-dam 500ft. long, and only 5ft. wide. The end of the dock had to be cut away and the shipping maintained in 30ft. depth of water, by means of the dam, during the execution of the works. The whole of the shipping floated above it for a year and a quarter without accident. When the piles have been driven to a depth somewhat below the level of the intended foundation of the structure the space between the two rows of piles is filled in with clay puddle. This is usually tempered and prepared of the proper consistency before it is filled in. In order that the bottom of the excavation may be laid dry the piling and the clay puddle must be taken down to retentive ground, such as clay. This is often overlaid with porous material, such as gravel. It is difficult to drive piles through gravel, and if it is of great depth impossible. The gravel, therefore, is dredged away, and the clay laid bare for a width somewhat greater than the outside width of the dam. This having been done, the piles are driven and the clay filled in, uniting with the impervious ground at the bottom. Even if the piles were driven through the gravel, and it were not removed, the water would come through the joints of the piling and through the gravel, and thus the object of the dam would not be accomplished. The piles of part of the dam constructed by Mr. Ridley for Mr. Ritson, the contractor for that part of the Thames Embankment extending from Waterloo Bridge to the Temple Gardens, were driven through the sand and gravel overlying the clay to save time, but the effect was, as stated by Mr. Ridley in a paper read at the Institution of Civil Engineers, that the driving was a slow and difficult operation. In many cases it was all but impossible to force the piles down, and about one-sixth of the whole number pitched (that is placed) having, in the process of driving, appeared to have failed, were drawn, and other piles were substituted. Whenever a pile was observed to show symptoms of failure in driving it was drawn. Generally the piles drawn were found to have cast their shoes, and their points were bruised into a mass of tangled shreds. The failure usually occurred whilst the point of the pile was passing through a bed of close compact sand containing fragments of shells, which rested on coarse open gravel. Beneath the gravel, and resting on the clay, was a layer of septaria, which presented a serious obstruction to the passage of the piles. Once through this stratum, and into the clay, the driving became comparatively easy. The clear space for puddle between the piles in this dam was 6ft. The piles were of whole timbers, 12in. to 14in. square, and from 40ft. to 48ft. long, shod with cast-iron shoes weighing 70lb. each, and were driven, or were intended to be driven, 4ft. into the clay. Cast-iron shoes were used in preference to those of wrought iron, as giving, at an equal cost, a much larger base for the timber. Where the driving was very difficult, shoes having cast-iron bases and wrought-iron straps were employed. There were three tiers of walings, of whole timbers 13in. to 14in. square, through which, and passing through the puddle space, were bolts 2¼in. diameter in the lower tier, and 2in. in the middle and upper tiers. These bolts were placed at an average distance apart of 6ft. 6in. in each tier. Under the heads and nuts of the bolts cast-iron washers were placed, and it was frequently found that the pressure of the puddle had forced them into the timber to the full extent of their thickness, which was upwards of 2in. To guide the piles in driving, temporary half-timber walings were used on the inside of the guide piles, and bolted to them with 1½in. bolts. These were removed before the puddle was filled in. The sand and gravel enclosed within the dam was dredged to the level of the clay with the bag and spoon, after which the puddle was filled in. It was composed of London clay from the excavations of the Metropolitan Railway, mixed with one-sixth part of its bulk of gravelly loam, forming, when well worked and tempered, a consistent and tenacious mass.

Between the tiers of walings transverse struts were placed, to keep the sides of the dam apart at the proper distance when the bolts are screwed up. In this dam the struts were 8ft. apart longitudinally. At the other sections of this dam the sand and gravel overlying the clay were dredged away before the dam was begun, and no difficulty was then experienced in driving the piles. The dredging could not, of course, be confined exactly to the outside width of the dam, and therefore vacant spaces were left on each side. As soon as the puddle was raised to the level of low-water mark, the spaces which had been dredged at the front and back of the dam were filled in with a mixture of gravel and clay, to prevent the pressure of the puddle from breaking the piles between the lower walings and the solid ground into which they had been driven. This backing was carried up to the lower walings, and was of great value in increasing the stability of the dam. It was ascertained by the excavations thus made that the surface of the clay underlying the sand and gravel which form the bed of the Thames is nearly on the same level from Waterloo Bridge to the Temple Gardens, and is about 24ft. below the Ordnance Datum, which is 6ft. above Trinity low water mark, and 12ft. 6in. below Trinity high water mark. (Ordnance Datum is the mean half tide level at Liverpool, which is also practically the mean half tide level of other parts of the open coast, and the mean half tide level in this part of the river Thames is therefore 3ft. 3in. above that of the coast.)

The top waling was fixed at Trinity high water mark, the middle waling half way down, and the bottom waling at Trinity low water mark. Below this level the depth to the clay was about 18ft., and as it was all under water, no bolts could be applied to hold together the sides of the dam. The consequence was that in two instances, where the filling of the dredged space outside the dam had not been carried up, the pressure of the puddle within the dam bulged out the piles. It usually happens that the puddle settles after having been filled in, and leaves hollow spaces under the tie bolts, which form channels through which water leaks from the outside to the inside of the dam. To stop this run of water, an iron plate 12in. to 15in. square, with a hole near one of its edges, through which the bolt is passed, is slipped along the bolt, and hangs down from it. Thus the plate blocks the passage of water along the hollow space left by the settling of the puddle. In the dam alluded to above another method was adopted. When any leakage showed itself in the dam a hole was bored with a 3in. auger through the inner pile, immediately below the bolt where the leakage appeared, and through this hole cylindrical pellets, formed of clay and sawdust, were forced by means of a wooden staff driven by a mallet; pellet after pellet being driven into the puddle until the vacant space under the bolt was filled up.

Sometimes the puddle of a dam is divided by a central row of piling, and the bolts do not pass through both divisions in the same line, but are put through each half of the dam alternately, so that there is no clear run through for the water. The great dam at the Grimsby Docks was made in this way. It had three rows of piles, the front row being 7ft. from the middle row, and the back row 6ft. from it, making 13ft. of puddle.

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Within the last few weeks some experiments have been made in Preston on lighting the gas in the street lamps by electricity. The experiments are said to have been successful; if so, the arrangements, which are simple, should soon become general.

PURE SPRING WATER FOR LONDON.

If it were desired to do something for London in the strictly useful and practical way, it would certainly be impossible to hit upon anything more to be desired than a plentiful supply of *pure water*. To supply a great city with water has always been a problem in all ages and all places, and right well and nobly have some people done it. Rome, for instance, had its vast "aquaducts," useful and architectural at the same time, and most great Eastern cities have had their immense "tanks" of truly colossal proportions, and with no small an amount of architectural skill and feeling expended on them. The "Report" but just issued by Dr. M'Cormack, on the "Impurity of the Metropolitan Water Supply," throws some light on our own way of doing these things, not exactly in an architectural way, but in a practical one. A common man can very well understand it, almost as well, indeed, as the most scientific. *All* can judge, however dull they may be, of the taste and look, and hardness or softness, of water, of its goodness or badness, and whether it is drinkable or no. What the public want is simply *clear*, and *cool*, and *pleasantly tasting* water, soft to the touch; and the question is simply where can such water best be come at in sufficient quantities—from the rainfall, or from springs, or river supply? and must it go through any sort of *filtering* process; or is it best to take it as nature gives it? And if it has to go through any sort of filtering or purifying process, what ought that to be? Important questions these, requiring no small an amount of study and experiment, and perhaps a volume to discuss adequately and in detail. We can only give a few hints now and then, and offer a few thoughts about it. A very commonplace man, or housewife, can try a few experiments without apparatus, or chemicals, or much knowledge of science or scientific nomenclature. Let us try a few, perfectly harmless, and not very scientific or hard to understand. If there be a pump within walking distance of the experimenter, as by a miracle of chance there may be, fill a plain glass tumbler with the water from it, and allow it to remain out of the dust till the water has all evaporated out of it, and repeat this experiment, and it will be found that the inside of the glass—if the experiment be carefully done—will remain quite clear and clean: there will be no deposit of solid matter visible. But try this experiment with the common water as drawn from the cistern, and as obtained from the water companies, it matters not which, and after a few trials the clear sides of the glass will become perfectly *opaque*, just like ground glass, from the deposit of hard stony matter mechanically mixed with the water, and which is attracted by the inner surface of the glass, and adheres to the surface of it with such tenacity that it requires no small force to get it off. No "organisms" in either case are supposed to exist. The deposit seen is that to be always found on the sides of a common tea-kettle, and is, in reality, whatever its scientific name may be, neither more nor less than *stone*—as much stone as a bit of stone paving is. This it is that makes the water as supplied by the companies so intolerably hard, and disagreeable to touch and taste. It is, in truth, *stone-water*; everybody in London town knows but too well what it is and what it is like. It is almost impossible to drink it; it is not pure water—it is *stone and water*—not sugar and water, of which the Frenchman is so fond, but stone and water! Now, for another experiment. At any high tide procure a supply of Thames water, and put it through the same simple process, and it will be found that though there be a considerable deposit of mud or clay *mechanically* mixed with the water as it comes down the river, there will be little or nothing of the *stone* deposit before mentioned. River water is delightfully soft to the touch, and, like rain water, is the purest and softest of all waters. The River Thames has got so ill a name that almost anything we can say in its favour would be at once rejected; but the truth is that out of London the water of the Thames is not only pleasant to move about in, and to the touch, but is also pleasant to the taste; the impurities in it are *mechanically* mixed with it, and if allowed to settle do but little harm, absolutely none at all for all purely domestic purposes, with the sole exception of drinking, if even that. It is truly wonderful to reflect on the all-purifying powers of Nature. In spite of all contaminations the water of the river would almost seem to purify itself. Nature is never at rest—always working some good, preaching sermons with stones, and doing good with everything. But as our main purpose in calling attention to these very practical matters is to help in bringing about a better state of things in a simple and non-disturbing way, it would be to suggest to confine the company-supplied water to domestic purposes, and to provide the *drinking* water from its true and best source, the *wells* of London. We are convinced that the river water, if allowed simply to *settle*, would do for all ordinary domestic and cleaning purposes, that no scientific filtering is needed for such purposes, and that the presence or absence of a "water scorpion" or a solitary shrimp will do no great harm to any ordinary mortal. Thus we should have *soft* water for all household uses, and water pleasant to the touch. It is wonderful what a lot of purely scientific talk there is about the evils of "living organisms," always to be found in natural waters, and how we are warned against them, because they *are* "organised." But all food is organic. There is no way as yet discovered whereby the human system can be sustained on *unorganised* sand, or pounded stone, or iron filings. We are not advocating the drinking of impure water in any form; but surely it is better to imbibe a small organism which requires to be magnified a million or two times before it can be seen, than to be obliged to swallow the horrible compound of stone and water which the companies supply through their patent and scientific filtering apparatus. It is impossible here to help asking—for perhaps somebody can tell us—what is it in the far-famed waters of the Nile which makes the water of it so charming to the taste that all the world has talked of it from the father of history to the last of African travellers? Is it through filtering or not filtering? Is it nature or art that does the magic feat? Why should the mud of the Nile be good for man, and the mud of the Thames be the death of him?

There is one remark in Dr. M'Cormack's "Report" which cannot be too widely spread or known, and it is that the "criminal population of London are better off than the rest of us, and that no one *out* of the Penetentiary at Millbank drinks so pure and wholesome water, as they do that are in it." They are to be envied! The criminals drink of the pure water from the artesian well in Trafalgar-square, which, strangely enough, finds an outlet into the awkward basins in the square, always dirty and covered with rubbish of all kinds, and with *dust* in enormous quantities, so that to drink of it is impossible even to the most ragged and dirty of boys or girls. The doctor proposes that this important subject should be brought prominently before Parliament, and indeed it would be hard to find even in London a fact of greater or more startling significance than that of the purest of London water running to waste in a granite built tank, of architectural proportions, while the whole of London population is compelled to drink of what we have ventured to call "stone water," as hard certainly as any stone needs to be, and as unpalatable! What, indeed, could the House of Commons do better than to look to it, if only as part of its "sewage policy?" How much truly remains yet to be done in a simple and obvious way before the poor people of great London city get a draught of good wholesome water pleasant to the taste and touch. Is it not truly wonderful that, considering the number of foreign cities that have been supplied with water out of John Bull's ample purse, it should not have occurred to him to "organise" a something to supply his own capital city with the pure water which rolls under his very feet! Who will remedy it? C. B. A.

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ARTIFICIAL STONE, AND ITS APPLICATION TO CONSTRUCTIVE AND OTHER PURPOSES.*

HAVING explained the manufacture and chemical composition of the several descriptions of artificial stone, the author proceeded to point out some of the varied purposes for which they are peculiarly adapted.

The primary conditions of materials for construction are unquestionably strength and durability—those of a secondary nature being appearance, facility of application to the intended purpose, and economy in use. As regards strength, the value of the artificial stone herein described increases with age. By some experiments which were made for the purpose of testing their possession of this quality, numerous samples were proved, within a month of their manufacture, to be superior to Portland stone. At the age of 10 weeks, in stones made by Mr. Ransome's latest process, the strength, as compared with Portland stone, was found to be as 7,145lb. to 2,630lb. per square inch, and as compared with Bramley Fall, 7,145lb. to 5,120lb.; and as regards granite, 7,145lb. to 1,200lb. per square inch. With reference to durability, the artificial stone has been found practically to withstand the atmospheric changes of various climates, having been exposed to the cold of Russia and the heat and rains of India. In general appearance, the stone manufactured by these processes bears such a perfect resemblance to the best description of natural stones, as to mislead the most critical observers, whilst the facility of application and its economy in use will have been apparent from the foregoing description.

By means of the latest process, the field has been widely extended for the application of the stone produced thereby, and which, for convenience as distinguishing it from all others, has been termed Apœnite. It is now no difficult task to produce blocks of this material of any form and of any size, the only limit being the means available for handling them, upon the spot where they are to be employed. Moreover, the materials which form the bulk of Apœnite are, as a rule, generally to be found in abundance where hydraulic or other important works are being carried on, and for which purposes the new stone is eminently suited.

The want of such a material for such a purpose has long been felt, although that want, until recently, has been only partially supplied. In 1870 Mr. J. W. Butler applied for and obtained a patent for improvements for the application of concrete to structures and foundations, also to cofferdams and similar constructions. Mr. Butler's obvious desire was, in the first place, to provide a cheap and efficient substitute for stone for hydraulic operations, and in the second to render unnecessary the construction of false works, &c., and thus to avoid the expense connected with the employment of iron cylinders, hitherto so extensively used. The idea was certainly an excellent one, but its realisation appeared to Mr. Butler very remote, until it occurred to him that the material then introduced under the name of "Apœnite" would answer the purposes of his proposed methods of construction. He accordingly communicated with the author upon the subject; and with the sanction of the engineer, a set of hollow cylinders 8ft. in diameter and 9in. thick were made to form part of a retaining wall to protect the foreshore of the Thames at Hermitage Wharf, where they were accordingly sunk, and the result was satisfactory.

The arrangement proposed for economically carrying out this class of work is shown in elevation in Fig. 1. A timber staging is erected, upon which the materials may be mixed and moulded, the moulds consisting of an inner and outer framing, the space between the two forming the mould for each ring of a cylinder or hollow block, as the case may be. The courses are joined by means of a cement formed of similar materials to that of which the rings or blocks are composed. These are lifted from the staging on which they have been made, and lowered into position by an overhead traveller or crane, as may be most convenient. The lowest course is chamfered, as shown in the diagram, and when necessary from the nature of the soil, may be shod with iron. The operation of sinking is carried out generally in a precisely similar manner to that adopted with iron cylinders. The horizontal joints are made with alter-

Fig 1

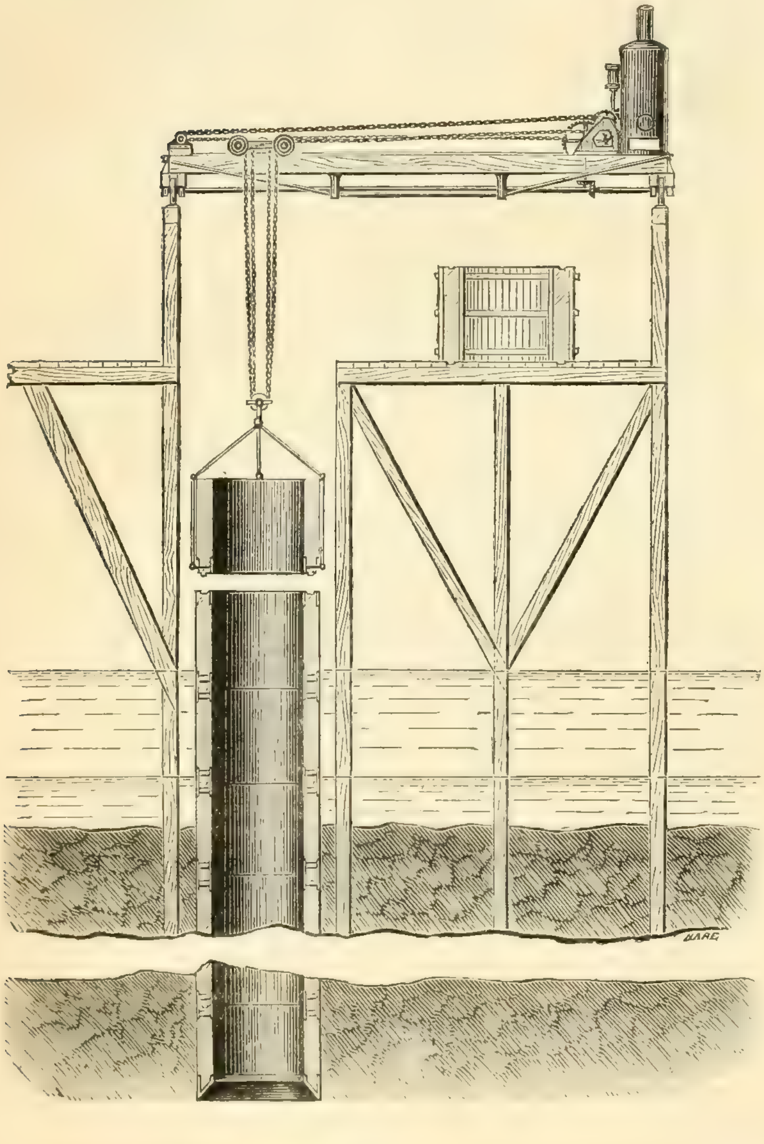
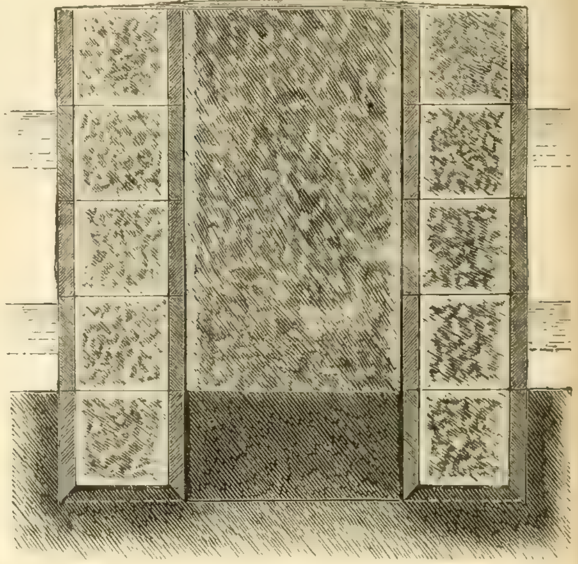
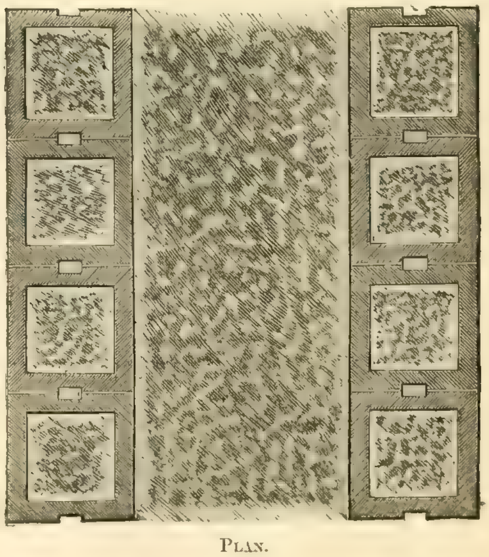


Fig 2



Elevation in Section.



Plan.

ARTIFICIAL STONE, AND ITS APPLICATION TO CONSTRUCTIVE AND OTHER PURPOSES.

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* Part of a paper communicated by Frederick Ransome, A.I.C.E., to the Mechanical Section of the British Association, at Brighton, 20th August, 1872.

nate projections and depressions, and the several courses are connected vertically by dowel piles, which also serve as guides in sinking the work.

The application of this principle is capable of modification to suit almost every variety of construction, and it will be found especially applicable in structures requiring heavy foundations, particularly where the ground is uncertain.

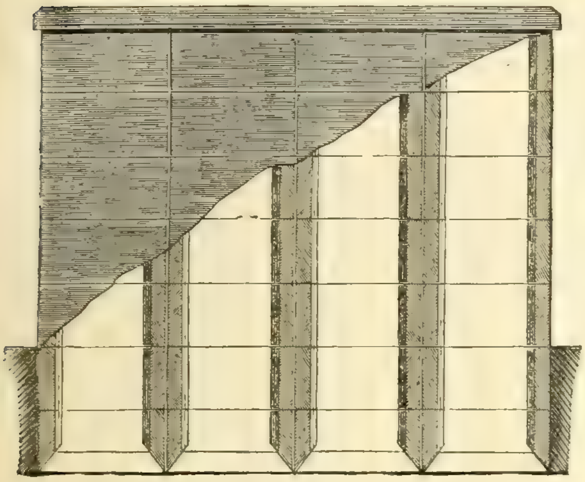
For forming a face-wall in building quays or docks, instead of cylinders, rectangular hollow blocks or caissons may be used, as shown in Fig. 2. By employing hollow blocks of hexagonal form no interstices are left, a thin layer of the cementing material rendering the structure practically homogeneous. Cylinders constructed upon this principle are also adapted for deep wells, apertures being formed in the sides for the admission of water.

Turning to works of greater magnitude, it will be seen that Apœnite forms a suitable substance for the construction of bridges, sea-walls, piers, and similar undertakings. Fig. 3 shows in plan and sectional elevation its application to a bridge pier. The structure could be carried up to the underside of the bridge girders, or built with ordinary masonry above high-water level. For sea-walls or piers the arrangement shown in plan and section in Fig. 2 could be adopted. Here two rows of caissons are employed, separated from each other longitudinally, the intermediate space being filled in with dry rubble hearting, and the blocks themselves with a similar material, or if necessary with concrete.

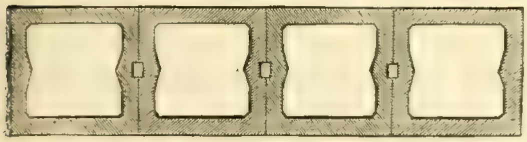
In the case of an embankment for a reservoir, the heart of the bank, which is usually made with a puddle wall, is proposed to be substituted by two rows of cylinders, the contained spaces being filled in with puddle, and the cylinders themselves with material similar to that of which the bank is made. This arrangement is shown in Fig. 4. In sinking the cylinders, they would be carried some distance below the natural surface, so as to obviate any chance of leakage below. Should a leak occur above, it could be only to a very small extent, as it would be prevented from extending by the proposed structural arrangement. It is obvious that this plan could without much difficulty be applied to embankments already constructed where there was reason to apprehend that any settlement had occurred. By sinking the cylinders from the top through the puddle bank, but without removing any of the slope on either side, they would be carried down to sound ground, rendering the embankment safe, and removing all fear of danger in the future. A cheap and efficient coffer-dam is shown in Fig. 5; such a dam could be constructed under any conditions, and at a cost less than half of that of a timber dam.

Besides possessing the several properties which have been described, the Apœnite, when prepared with suitable materials, is capable of receiving the most delicate impressions, and by the incorporation of various metallic oxides, any variety of colour can be imparted to it. By the use of the native red oxide of iron, manganese, and other mineral substances, artificial marbles or granite of almost every description can be produced. These artificial stones, like their originals, are capable of taking an excellent polish, are extremely hard, and can be readily moulded into the most elaborate forms at a very small cost.

Fig 3

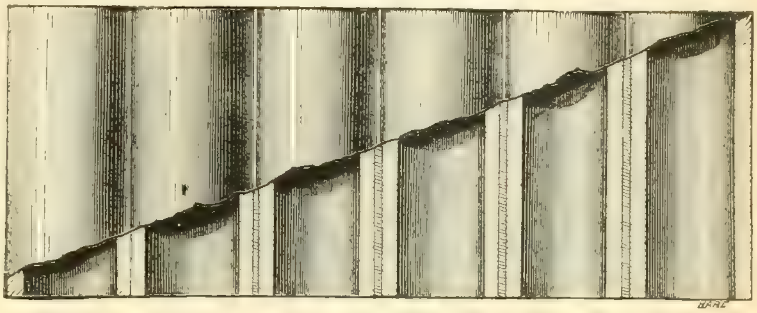


Elevation in Part Section.

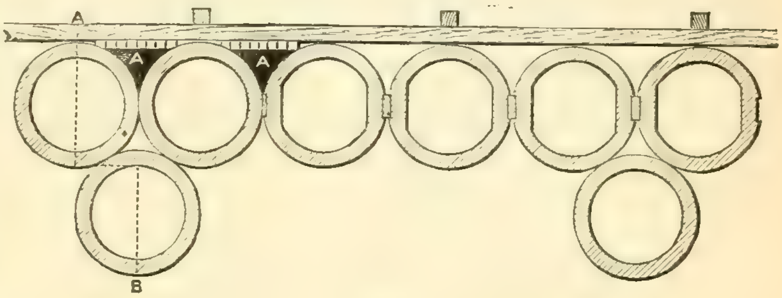


Plan.

Fig 5

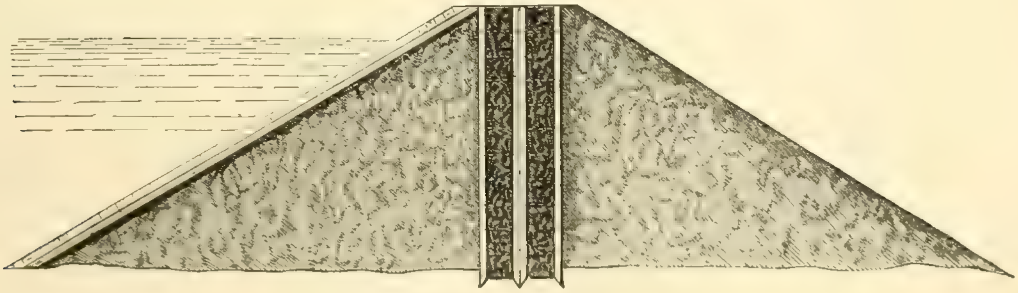


Elevation.

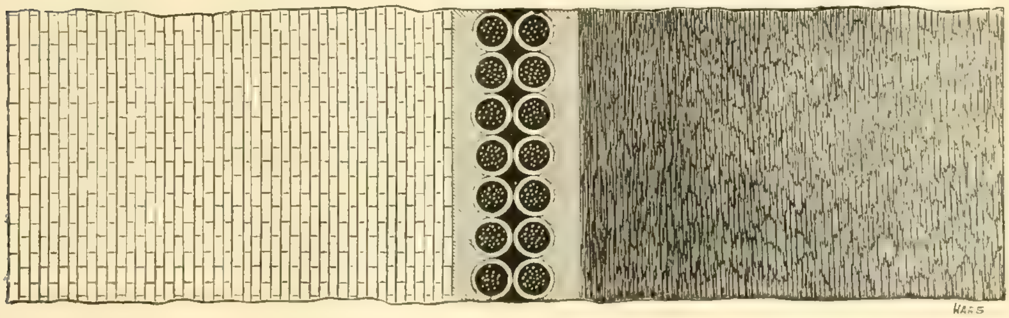


Plan.

Fig 4



Elevation in Section.



Plan.

ARTIFICIAL STONE, AND ITS APPLICATION TO CONSTRUCTIVE AND OTHER PURPOSES.

THE DESIGNS FOR THE PROPOSED CATHEDRAL, EDINBURGH.

(From the *Scotsman.*)

WE had yesterday an opportunity of inspecting, in the galleries of the Royal Scottish Academy, the competing designs for the Cathedral of S Mary, intended to be placed at the west end of Melville-street. As our readers are aware, funds for the erection of such a building, to the amount of £65,000, were bequeathed by the late Miss Walker, of Coates. With the view of securing the most satisfactory application of the bequest, the trustees charged with its management invited the following architects to submit plans for the proposed building —viz., Messrs. Peddie & Kinnear, and Mr. Lessels, Edinburgh; Mr. Ross, Inverness; and Messrs. Burges, Street, and Gilbert Scott, London. In each case the invitation was complied with, and the results are now exhibited in the shape of six sets of plans, which, on and after Monday next, will be open to public inspection, on presentation of tickets to be obtained for the asking at Messrs. Taylor & Sons, Princes'-street. In accordance with the prescribed conditions, each set of plans embraces complete elevation drawings, as well as pictorial views showing the external and internal effect of the building therein foreshadowed. There are thus ample materials for judging of the merits of the respective designs, while even without regard to any ulterior object the drawings form in themselves a very interesting exhibition. During the fortnight or so that they have been laid out, the plans have been carefully examined by the trustees, on whom falls the duty of making a selection. Several meetings have been held with the view of comparing notes, but, there being a considerable diversity of opinion, no decision has yet been come to; and we understand that at the last meeting it was resolved, before deciding, to hear the views of an eminent London architect. Meanwhile it will not be uninteresting to indicate the leading features of the designs.

The architect whose design is distinguished by the motto "Auld Lang Syne," and whom by various characteristics we are led to identify as Sir Gilbert Scott, had, we understand, sent in two sets of plans, indicating alternative modes of treatment, but being informed that this could not be admitted, he took his stand on the drawings now exhibited. The objects aimed at in framing this design were to give the church a dignity of effect suitable to its metropolitan position, and to afford in the choir sufficient space for the assembling of the clergy in presence of their bishop. The style of architecture is based on the earlier phase of the Early Pointed, of which fine examples survive in the north aisle of Holyrood Chapel, in certain parts of Jedburgh Abbey, and in S. Andrew's Cathedral. Eschewing Transitional features, such as the round arch, the architect has adhered to a strictly Pointed outline, introducing, however, certain ornamental details of Norman character. In ground plan the church is cruciform, with a lofty tower and spire springing from the intersection of the nave and transepts. With a view to provide for congregational requirements, an unusual width is given to the nave and transepts, and aisles are introduced on either side of the transepts as well as on the other arms of the cross. The west elevation shows, in the centre, a deeply-moulded doorway surmounted with a gablet, and over this four pointed windows enclosed within a Gothic arch, the head of which also embraces a handsome circular window. The end of each aisle has a single pointed window, and the elevation is finished atop with a gable, flanked by octagonal pinnacles, which rise from the buttresses supporting the corners of the nave. The east elevation, being that intended to face Melville-street, is somewhat more elaborate in its treatment. Here the end of each aisle shows two windows, and in the centre of the nave are three windows surmounted by a series of niches intended for the reception of statues. The gable, as in the case of the west elevation, rises between handsome pinnacles, and terminutes in an ornamental finial. At the north-east corner, connected with the main building by a short cloister, is the chapter-house, a structure square in ground plan, but assuming the octagonal form in its upper stage, and forming with its pointed windows and massive buttresses an effective feature in the eastern view. In the north and south elevations we have two ranges of windows, those of the aisles being comparatively plain, while those of the clerestory are of a more ornate character. The line of wall in each case is broken up by buttresses, and the ends of the transepts, which are treated somewhat in the same manner as the west gable, come in as conspicuous features, as does also on the north side the chapter house above referred to. The central tower, square in its lower stage, aasumes at no great distance above the roof the octagonal form, the corners of the original square being finished off with pinnacles. Pointed windows of various design diversify each stage, and the structure terminates above in a lofty octagonal spire, which with the tower forms a conspicuous feature in most views of the church. The general effect of the design is that of harmonious proportion and dignified simplicity. In the treatment of the interior the architect has been careful to consult the convenience of the congregation. The supporting piers of the great tower are so designed as to offer the least obstruction to sight or hearing. The triforium and clerestory show effective ranges of deeply moulded arches, and the general result is in admirable keeping with the style of the exterior. In regard to the question of cost, the architect, without coming under any pledge, indicates that he has carefully aimed at keeping within the available funds.

The design signed "Fidelitas," which we take to be that of Mr. Burges, is framed in accordance with a severe and comparatively early style of French Gothic, which approaches pretty nearly to the Scotch style. In the west elevation we have three pointed doorways with deep and highly ornate mouldings, surmounted by gablets, over which again runs a range of niches intended to receive statuary. Over the niches is a beautiful round window enclosed within a pointed arch, and the outline of the gable, which supports a statue on its apex, fills up the space between the two towers springing from the angles of the nave. The great central tower falls in behind the gable; and the transepts projecting on either side complete what, as seen from this point, forms an exceedingly effective group of buildings. The north elevation shows in the aisles a plain range of one-light windows, separated by buttresses whose pinnacles present niches for statuary, and in the clerestory two-light windows, with finely traceried heads. The end of the transept, with its splendid round window, repeating that of the nave, is a prominent feature, as is also the chapter-house, whose buttresses, like those of the aisles, terminate in ornamental finials. The south elevation repeats the general features of the north, and at the east end, facing Melville-street, there is a round apse boldly buttressed, which falls in effectively with the gable of the chapter-house. The interior is arranged with due regard to the comfort of a congregation. The aisles are carried round the choir, thus giving free access from one part of the building to another. Keeping the aisle walls plain, the architect has expended his decorative resources on the clerestory, which is a leading feature inside, as well as outside the building. The ceiling is proposed to be groined throughout with stone, and the roofs, as well as certain portions of the walls, are intended for future decoration in colour.

Mr. Street's design—for his we presume to be the set of plans signed "In hoc signo"—is an attempt to realise as closely as possible the national architectural traditions. The arrangement is cruciform, there being a small tower or lantern with plain roof at the crossing of nave and transepts, and a lofty tower and spire at the west end. In the base of the west tower is the main entrance, and the tower itself, which is boldly buttressed and pierced at different stages with windows of varied design, forms an important feature in the building. A chapel is introduced on the east side of the south transept, and ample vestry accommodation is provided. The style adopted is carried out all through with great skill and admirable consistency, and the result is a building characterised by accuracy of proportion and a certain severe simplicity of general effect. In the interior, care is taken to secure ample space in the nave and transepts, and the choir as well as the nave is furnished with aisles for convenience of passing round. A vaulted gallery is provided in the west tower, which can be used for congregational purposes or appropriated to the reception of a grand organ. The whole eastern part of the church, transepts and choir, with its aisles, are proposed to be covered with stone vaulted roofs, but the nave, being too wide for such treatment, would be roofed with timber. In the absence of a triforium, the general effect of the interior is somewhat less imposing than in the case of the churches above described.

"Non ignotæ civitatis municeps" hails, if we mistake not, from Inverness. His design embraces all the parts which go to the formation of a complete cathedral—arcade, triforium, and clerestory, nave, transepts, and towers. Considering, however, that the funds available in this instance are not adequate to the construction of a great central tower, he has contented himself with placing two of moderate size at the west end of his building, and marking the intersection of the nave and transepts by a simple *fleche*. The west elevation is pierced by three doorways deeply moulded, and over these by an elaborate window; and the upper part of the gable falls in between the flanking towers, which rise in three stages, diversified by buttresses, pinnacles, and pointed windows, and terminate in lead-covered spires. The north and south sides have double windows of simple design in the aisles, and, in the clerestory windows arranged in pairs, while the transept ends present round windows combined with others of the pointed form, and terminate above in gables flanked with pinnacles. In the east elevation we have a round apse of rather plain design, with a chapter-house coming in on the south side. The interior shows a triforium and clerestory boldly treated, and is evidently intended to have its effect enhanced by the copious use of colour.

Of the two Edinburgh designs, that which bears the motto "Essayez moi" is understood to be the work of Mr. Lessels. It presents a cruciform building, with decagonal apse at the east end, conceived in a style which speaks of assiduous studies among the German cathedrals. The principal entrance is at the west end, and there are also doors in the north transept and south aisle of the nave. In the angle formed by the north transept and the north aisle of the choir is placed a chapter-house, which has a separate entrance from the outside, and on either side of the choir, at its junction with the apse, rise octagonal chapels, which are carried up externally as memorial towers, intended to commemorate the two Misses Walker. The great tower, which springs from the crossing of the nave and transept, presents in its upper portion a striking resemblance to the well-known crown of S. Giles. In the external appearance of the building, the florid tracery of the windows, and the ornamentation lavished on various points, such as the buttresses of the apse, form an important element. The interior is without triforium, and in general effect will hardly bear comparison with one or two of the rival designs. The wall space between the apex of the arches under the tower and the sills of the lower tower windows are proposed to be panelled, with a view to the introduction of frescoes illustrating events in the life of Christ; while the space over the archway between the choir and apse is intended to receive a painting of the Last Judgment.

The other Edinburgh design has also been framed on the principle of having a large central tower with two smaller towers, but in this case the latter are placed at the west-end. The style has been adjusted with the view of imparting to the building as much as possible of a Scotch character. In the west elevation, which contains the main entrance, we have the gable of the nave pierced by three windows with elaborate tracery, and, separated from these by an open parapet, a circular window enclosed in the angle of the gable, whose apex is crowned with a finial. On each side rises a square tower, heavily buttressed at the corners, pierced by windows of various design, and finished atop with an open crown, evidently suggested by that of S. Giles. The south elevation shows ranges of four-light windows with florid tracery, and in the transept, which repeats some features of the west gable, a doorway surmounted by a parapet which is somewhat curiously diversified with a row of pinnacles. The north elevation resembles the south, but with the addition of a large chapter-house. In the central tower, rising from the crossing of the nave and transepts, we have something like the spire of Glasgow Cathedral, combined not very happily, we take leave to think, with features borrowed from S. Giles. Throughout the design sculpture is introduced to a certain extent, both internally and externally, in the form of niches, canopies, and statues.

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Sir John Lubbock writes to say that, according to information which has reached him, the occupier of the farm near Stonehenge is actually ploughing up the well known "cursus." The profit to be derived from this must, says Sir John, surely be insignificant, while the loss to archæology will be great.

The contracts for the Unstone new schools have been let to Messrs. Platts Bros., masons, Dronfield, and Messrs. Broomhead & Brothers, joiners, Whittington Moor. The buildings will be of dressed stone with brown tint facings. There will be two schools—one, to be used as a mixed school, 42ft. 3in. long and 18ft. wide, and an infant school, 33ft. long and 17ft. wide; also two class rooms, each 19ft. 6in. long by 14ft. wide. Accommodation is to be provided for 232 children, at a cost of about £700.

According to statistics in the annual report of the Metropolitan Police Commissioners, during the year 1871 there were added to the duties of the force the supervision of 226 new streets and two squares, a total length of more than thirty-eight miles. During the past ten years there were built in the metropolitan police district nearly 150,000 houses, with an additional length of streets amounting to 635 miles, equal to the distance from London to Inverness, and forty miles beyond.

GOSSIP FROM GLASGOW.

GLASGOW is not a show city. Many of our public buildings are respectable, but few are imposing, and perhaps the Cathedral, the "Necropolis," the Trongate, the river, several great factories and shipbuilding-yards, and the parks, comprehend almost all the "objects of interest" for the ordinary sight-seer. But of these "the second city in the empire" has some reason to be proud—the Cathedral, besides being a great work, perhaps the most complete remain of ancient ecclesiastical architecture in the kingdom; the "Necropolis," that rivals the famous Pêre-la-Chaise, and is celebrated alike for its picturesque situation and its landscape composition, the view it commands and the monuments it contains; the Trongate, that was said by Burke, Brougham, or some other busy B., to be the finest street in Europe—the aorta of the city, extending (under several names) three miles in length, averaging 70ft. in width (sometimes more, seldom less), almost straight, and busied with a traffic surpassed by only that of some of the great thoroughfares of London; the river, across which men still living have waded, and which now admits vessels 300ft. in length, and drawing 23ft. of water; factories, like Tennants', with its chimney as high as the Pyramid of Gizeh, and shipbuilding-yards I believe unequalled in the world; and the public parks—which will be the chief subject of this paper.

Until 1852 the only public park possessed by Glasgow was "The Green," a comparatively level sward of about 140 acres, situated in the north-eastern district of the city, and having its southern margin washed by the river Clyde. So early as 1450 part of the Green was included in the grant which James II. made in favour of Bishop Turnbull, for the benefit of the community. The most prominent object in this park is an obelisk 144ft. in height, erected in honour of Admiral Nelson. Not far distant is an out-of-doors gymnasium, the gift of a Glasgow gentleman resident in Manchester, and which, amply furnished with most of the apparatus common to such schools, is free to all who may wish to use it. The Green has been often the scene of great public meetings; it affords convenient as well as ample accommodation for military reviews, and is still the favourite field for football and cricket, while in the beautiful bend of the river fringing its margin is Glasgow's only opportunity for swimming and boat-racing. Opposite to the western boundary is the gaol, with Stark's exquisite portico, the street between them leading immediately to the latest built and furthest-up-river of the great bridges. Upon this western boundary was wont to be held that part of Glasgow Fair commonly called "the Shows"—a large collection of Thespian stages, hippodromes, menageries, &c.; but a year or two ago it was resolved by the *ædiles* that the shows should be removed from property in the trust of the Town Council. Having had always a liking for the near relatives of Mr. Vincent Crummles and Mrs. Jarley, I this year followed them to their new local habitation, and in my journeying I came most unexpectedly, in quite an out-of-the-way corner—somewhere in Fordneuk-street—upon an immense factory, built of brick, and possessing largely some of the highest qualities in architectural composition. It is said that Augustus found Rome of brick and left it of marble; yet it seems possible to give rare dignity—I use the words advisedly—to even a brick-built factory. Grandeur of effect has been achieved by other and subtler means than mere oneness of colour; but I may instance the spare use of white brick as among the evidences more immediately obvious of that consummate judgment which has been exercised throughout. In less skilful hands other coloured bricks would have been welcomed and freely employed to give that facile variety always fatal to breadth, one of the first elements in grandeur of composition.* But I must return to "The Green." Of late many improvements have been made in the way of planting shrubs and flowers, &c., and as I write, a large space opposite to the gaol is being remodelled, a massive granite and iron railing and gateway from designs by Mr. Carrick, the city architect, being put upon it, and the extra-mural part being laid with Val de Travers' pavement. From this gateway—directly opposite to the gaol portico—an avenue lined with a double row of poplars will lead to the Nelson monument. When the Salt-market—a thoroughfare leading from the gaol to the Trongate—is reconstructed by the Improvement Trust, this part of the city will present a very different aspect from what it did to the eyes of Bailie Nicol Jarvie.

But Glasgow, stretching out in every direction, required other parks than the Green, and to satisfy the claims of the West no grounds could be more eligible than the lands of Kelvingrove—the richly-wooded "policy" (as it is called in Scotland) of Kelvingrove Mansion. In 1852 they were purchased by the Corporation, and shortly after Sir Joseph Paxton was commissioned to "lay them out." Kelvingrove Park is not more than sixty acres in extent, but its sylvan scenery, compact form, natural terraces, and many and varied vistas, with pastoral pictures peeping into, and the classic Kelvin streaming through it, much more than compensate this littleness of area, and aid to make the "West-end Park," as it is commonly called, one of the most attractive retreats to all classes of the citizens. A convex crescent of houses for our "merchant princes," raised upon an architectural terrace, and crested with occasional mansard roofs, crowns the northern boundary and highest part of the park with magnificence and picturesqueness; in season the south is screened by the kindly foliage of an avenue of beeches; across the Kelvin and on the west is enthroned upon a hill the new buildings for the University; while on the east the great city is as completely shut out as if it were twenty miles away by trees that even Dr. Johnson would have been compelled to recognise. Other features are the great granite staircase, the pretty little bridge (built specially for the visit of the Prince and Princess of Wales), a group of sculpture in bronze modelled from sketches by Rosa Bonheur, the flower garden, the rookery, the museum, and "the memorial fountain." The museum is in the old mansion, remodelled for the purpose, a curious yet somewhat fascinating building of the Georgian era, and which I suppose the Corporation at one time did not know what to do with, and from perhaps some old associations hesitated to take down. The lower halls are appropriated to local industries in the processes of progress from the material in the mine, the field, or the forest, to the article in the sale shop; one of the upper is fitted with "a fouth o' auld nick-nackets," local curiosities, and other miscellaneous objects, one of the principal of which is Fulton's orrery; and another contains a collection of Scottish natural history, largely indebted to the enthusiastic perseverance of the intelligent curator, Mr. Thomson. It may be mentioned that the museum, like the Corporation's gallery of paintings and sculpture in Sauchiehall-street, is open free to the public, the expense of maintenance being defrayed from the local taxes. The fountain was completed only last week, and is from many causes one of the most attractive objects in the park. Its intention is to commemorate the services of Lord Provost Stewart in bringing a supply of water to Glasgow from Loch Ketturin. Two years ago the Water Commissioners invited architects and sculptors to submit designs. About seventy from several parts of Britain, from France, and from Belgium, were sent in. and after due deliberation the premium was awarded to Mr. Sellar, of Glasgow. Meanwhile some people grudged the amount of money intended to be expended, £4,000, and consequently a second competition was resolved upon, the sum to be £2,000, and the competitors a selection from the former ones. In this competition Mr. Sellar was also successful, and his design was adopted. The style is Scottish Gothic. The leading idea in the design is a "crown" formed of cross-ribs rising from buttresses, the buttresses supporting also the principal basin, and the ribs meeting over it. From the keying of the ribs rise clustered pillars which support the upper basin, and whence springs a pedestal on which is placed a bronze statue of the Lady of the Lake. The upper part of the fabric is richly decorated with blazonry and carvings of aquatic animals and plants, and on the base are four bronze panels, that on the south containing a bust in *alto relievo* of Lord Provost Stewart; on the north an inscription-plate; on one of the remaining cardinal points a scene from the "Lady of the Lake," and on the other an allegorical representation of Loch Ketturin and Glasgow. The structure rises to a height of about 40ft. from a pond circled by granite, and 65ft. in diameter. In the pond are a few fish and aquatic plants, and on its margin-cope are several drinking-fountains. "Situated," says the *Herald*, "on a gentle mound in the centre of the flower-garden, it harmonises well with its surroundings, and its graceful outlines are finely relieved against the rich mass of foliage by which it is encircled." As an architectural work, this fountain is the subject of universal admiration, the profession, the press, and the public uniting, so far as I can learn, in giving to it almost unqualified praise. Of the statue the *Citizen* says:—"The crowning ornament is the figure of the 'Lady of the Lake,' by our distinguished local artist, Mr. Mossman. The sculptor has been happy in his realisation of the poet's beautiful ideal—

> And ne'er did Grecian chisel trace
> A Nymph, a Naiad, or a Grace
> Of finer form or lovelier face.

From all points the *pose* of the 'Lady' is graceful and dignified." The other bronzes are also by Mr. Mossman. And a word of commendation is justly due to Mr. Young for the carving, which is alike spiritedly modelled and excellently executed. But while thus admirable architecturally, I fear that the fountain as a fountain is not altogether a success. If, as the great dramatist says,

> Men's evil manners live in brass, their virtues
> We write in water,

it can scarcely be complimentary to the memory of Lord-Provost Stewart, the water being so scant and the brass so plenteous; if, however, the chief idea sought to be impressed is that the water from Loch Ketturin is a most valuable boon to the community, then this could not have been better illustrated than by showing that it is much too valuable to be wasted upon "inexplicable dumb show." The water is not only petty in quantity, but the playing of it is commonplace to a degree, and this poverty of play is felt the more when we look at the eminently suggestive outlines of the building. Besides, more water and a different treatment were required by a very important consideration. The statue on the summit is wholly gilt—

> When gleaming with the setting sun,
> One burnish'd sheet of living gold—

and so much brilliance requires some support, which it would have received from glassy domes, cascades, and curtains. Instead, the water trickles in tiny rills from beneath the statue's feet, as if the thought intended to be conveyed was that the Lady was the discoverer of the source of the Lake, not that Loch Ketturin was bounteously bestowing its water upon Glasgow. The *Herald* thus writes apologetically for the water part of the fountain, the Hamlet of the play:—"In the design Mr. Sellar has judiciously kept in view that the structure should be not a mere garden fountain, depending on the water jets for its outlines, but a monument architecturally grand in itself. This was the more necessary, as the water will be only in play occasionally." I am not sure whether this last consideration was mentioned in the conditions of competition; if not, then, as the *Herald* continues—"in this Mr. Sellar has been eminently successful." While it would be difficult to withhold from the design executed the highest commendation, I would nevertheless take exception to its style. Gothic is chiefly associated with times of turbulence, when the greatest good was for the smallest number, and hence seems scarcely appropriate for a memorial of a great work of universal beneficence; its lines are harsh, hard, and angular, and therefore do not readily harmonise with the softness of such sylvan scenery as is immediately about the fountain. The Renaissance would have given all the picturesqueness and met all the objections.

Having in this paper exceeded my limit, I must leave over the other parks until another opportunity.

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* I was unable to ascertain the name of the architect of this most meritorious work. Some one who knows may perhaps give it through your column of "Intercommunication"

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THE STEWART MEMORIAL FOUNTAIN, GLASGOW.

THE inauguration of this beautiful memorial fountain took place last Wednesday, in presence of several thousands of the worthy citizens. The fountain was designed by Mr. James Sellar, jun., and is in the Scotch Gothic style. From a central basin 60ft. in diameter it rises to a height of 40ft., in a series of stages or smaller basins, each richly ornamented with sculpture. Round the front of the lower basin are placed four bronze panels, that facing the south containing a medallion of the late Lord Provost Stewart, and flanked right and left with the Stewart arms and those of the City; the arms of the north medallion are similar to the south. The east and west panels contain allegorical figures, representing the source of the Loch Katrine water supply and its introduction to the city; on either side are the arms of ex-Provost Sir Andrew Orr, ex-Provost Galbraith, and ex-Bailies Hannan and Gourlay. The fountain bears the following inscription:—"To commemorate the public services of Robert Stewart, of Murdostoun, Lord Provost of Glasgow from November, 1851, till November, 1854, to whose unwearied exertions the citizens are mainly indebted for the abundant supply of water from Loch Katrine, this fountain was erected in 1872." It is crowned on top by a gilt bronze figure of the "Lady of the Lake," from the hand of Mr. Mossman, sculptor, Glasgow. Small drinking fountains are placed at intervals round the outer basin. The work was executed by Mr. James Robertson, and the carving by Mr. James Young. Our Glasgow correspondent gives some further particulars of this fountain. See "Gossip from Glasgow."

WORK AND WAGES.*

THE publication of his father's memoir by Sir Arthur Helps suggested to Mr. Thomas Brassey the idea of collating the results of his long and varied experience of the cost of labour, and also of setting forth results of a kindred character. Sir Arthur Helps, who has "seen the work through the press," contributes a preface. Mr. Brassey adds little or no new information on the labour question to that already within the reach of those interested in the matter, neither has he, so far as we can discover, anything new to suggest with a view to the permanent settlement of the great questions which at present disturb the industry of the country. His position may be gathered from the concluding sentences of his introduction—"I feel myself impelled by many and potent influences to take the employers' view of the labour question;" but, on the other hand, feel that the working classes possess "especial claims on my sympathy and gratitude."

The introduction is followed by an "historical sketch" of the recognition of the rights of labour and an account of the rise of trades' unions. Trades' unions, Mr. Brassey believes, can only, by their organisation and united action, secure an advance of wages at a somewhat earlier date than that at which it would *eventually* take place, owing to competition among employers. He is also of opinion that the advantage of the earlier increase of wages thus obtained does not compensate for the loss sustained by unsuccessful strikes, and the expense of subscribing to the unions. Working men up to the present appear to be of a widely different opinion. We think the most violent unionist would agree with Mr. Brassey's first statement; the difference of opinion between them would occur on the meaning of the word "eventually;" and the disinclination on the part of the men to wait the unknown period at which the employer must voluntarily increase the rate of wages is, all things considered, not much to be wondered at. Mr. Brassey is at considerable pains to point out that the rate of wages depends on the prosperity of trade, and gives instances to prove this statement from the statistics of railway works carried on from 1843 to 1869, showing that even navvies who were earning 24s. per week in 1846 were compelled to accept 15s. in 1851, and have never since earned anything like the weekly wages of 1846. He also affirms that the workmen of foreign countries have, during the last thirty years, received a very large increase of wages without the aid of strikes. However true this last assertion may be as regards the past, it cannot apply to very recent dates. Berlin and other continental cities have quite lately been the scenes of strikes quite as protracted and, in some cases, so far as we can judge, entered upon with less reason than those which have taken place in this country. The increase of wages on the Continent is no more remarkable, when the revival of industry which succeeded the depression caused by the great war is considered, than the absence of strikes when the political condition of the working classes is borne in mind. It is not so long since that the right to combine for the purpose of obtaining better terms from the capitalist has been granted to the continental labourer as to cause us to wonder that it has not more frequently been asserted. Now, however, that the power has begun to be used, its more frequent exercise may confidently be predicted, and perhaps in a manner not altogether to their disadvantage when compared with that of our own workmen.

The principle of the dependence of wages on the varying demand for labour is, according to Mr. Brassey, fully illustrated at the present time. Is it? Is labour scarce in the building trades at present? What was the plea of the carpenters for entering on the strike which, it is to be hoped, is about to end, but that a certain number among them were out of work and that by working fewer hours they wished to ensure their employment? We are not guaranteeing the correctness of their statement or the purity of their alleged motive, but simply mention it to show that men do strike for higher wages, and will probably receive them in a branch of industry in which no very extraordinary activity just now prevails. All Mr. Brassey's instances of the wonderful rises in the rates of wages in India, the United States, and South America do not really touch the questions in dispute at home; they are all partial, isolated cases; the employers were obliged, from sheer necessity, to give high wages to attract labour at all; the question was not, as it is at home, one of a somewhat more equal division of profits between the capitalist and the workman. "There must be," says Mr. Brassey, "a remarkable superiority either in vigour or in skill in the English workman, or he could not have held his own in the race in spite of the extraordinary difference in the rate of wages" (compared with that of foreign nations). It is just for this superiority of vigour and skill that the English workman insists on higher wages, and for which foreign capitalists—in spite of the low wages paid to their own workmen—are quite ready to bargain if they are declined by his own countrymen. That this will not be the case will, we believe, be owing to the wisely regulated action of the Trades' Unions, by means of which a legitimate pressure may be brought to bear on unwilling capital.

Some statistics gathered by Mr. Brassey with respect to the hours of labour are likely to be of some value in reassuring those who persist in looking on the demand for fewer hours of labour as practically an increase of wages for less work. In 1842 Messrs. Hornby, of Blackburn, made a calculation that if their operatives were paid the same sum for working sixty as for sixty-nine hours per week the increased cost of the work done would be so small as not to be weighed against the advantage to the operatives themselves of a larger period of leisure. More recently Messrs. Dolfus, of Mulhausen, found that their men have done five per cent. more work working eleven hours per day than when they worked twelve. In Russia the peasantry begin work in summer at 2 a.m., ceasing at 9 p.m., with periods of rest intervening equal to two or three hours, leaving from sixteen to seventeen hours' work per day. Persons competent to judge consider that an English farm labourer would do as much work in ten hours as two Russian peasants would accomplish in sixteen hours. Again, in Ipswich, in the large establishment of Messrs. Ransome & Sims, it has been found, since the commencement of the present year, that the men do more work in 54 hours per week than they previously did in 58½ hours.

On the subject of emigration Mr. Brassey has some very sound remarks. He fails to find in it the remedy for pauperism for which some profess to seek. He points out that the emigrants who succeed abroad are just those who by thrift and industry succeed at home, though, perchance, in a less degree, and that what the colonies and dependencies of the Empire call for is the presence of more men with capital to develop their resources.

With regard to co-operation, Mr. Brassey points to the Association of Maçons, established in Paris in 1848, as an illustration both of success in the conduct of the co-operative business and of the difficulties inseparable from the system. The society consisted of 84 members, two being managers and the third assistant manager; of the remaining 81 members two-thirds are actually working members. But the society, though very successful in business, has been compelled to employ from 200 to 300 men as auxiliaries, who are paid the usual trade wages, but do not share in the profits. Experience proved that when they were paid by a share in the profits a large number of the men could not be reconciled to the losses. To meet this difficulty it has been proposed that the minimum rate of weekly wages should be fixed on the co-operative society, and that a dividend on the profits should be declared quarterly. It is objected to this plan that, as the workmen's share of the profits is determined by the cost of manual labour, and this must be fixed by the assent of all the members of the co-operative society, a direct conflict of interest inevitably arises between them and the capitalists in fixing the standard of the provisional remuneration which they are to receive. Mr. Schulse de Litsch, who has successfully developed the system in Vienna and in North Germany, in his letter to the recent Co-operative Congress, reveals the difficulties in the way of reducing his admirable theory to practice. In France such societies have been unfortunate; fifty-six have been founded since 1848, aided moreover by a Government subvention, but only twenty were in existence in 1861. In England, of the many experiments in course of trial, that of the Messrs. Briggs is at present the most hopeful. Here, however, the workmen are shareholders to a very limited extent, holding only 264 shares out of 9,770. Piece-work meets with Mr. Brassey's approval, although he brings forward no good argument against the reasons given by artisans for their dislike to it, and acknowledges, that in his personal experience he has seen much to confirm Adam Smith's opinion, that "workmen, when they are liberally paid by the piece, are very apt to overwork themselves and ruin their constitution in a few years."

In its arrangement and style, Mr. Brassey's book bears evident marks of Sir Arthur Helps supervision, but there is throughout it a generous and kind tone of his own towards working men—inherited, doubtless, from his father, which leaves us free to confess that trades' unions, strikes, and lock-outs, would long age have become uncomfortable memories of the past were all employers to manifest in act half the consideration for workmen that he does in word.

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* Work and Wages, Practically Considered. By THOMAS BRASSEY, M.P. London: Bell & Daldy.

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HOW CONCRETE FOUNDATIONS ARE LAID.

LOOSE stones, says the *American Artizan*, thrown pell-mell into the water and falling into a heap flattened on top and sloping off at the angle of 45°, make a "rip-rap" foundation much used in engineering. The fort called the Rip-raps, opposite Fortress Monroe, goes by that name because built upon a foundation of this kind. Such is also the base upon which the bulkheads projected to surround the water front of New York City are designed to rest, a portion of the work, merely the beginning, however, being now completed, and in sight above the surface of the water at the battery.

The broken stone being piled on the bottom is roughly levelled off, and by means of pile-drivers there are driven down a number of wooden posts, which serve to retain in place a timber curb, which really constitutes a mould for the concrete (Portland cement) to be placed upon it to form the immediate support of the superstructure. The concrete is filled into the curb something more than flush with the surface, and then comes in the work of the divers. At one time, on the part of the work now done, four divers were employed for a short time, working four hours a day under water. These, clad in the well-known submarine armour, sweep a long wooden bar or beam across the top of the plastic concrete, and thereby smooth it down to a fair level, ready to receive the granite or concrete blocks, as the case may be, of which the bulkhead itself is built.

While on this topic, we may hazard a few words on this matter of the construction of docks, and the disappointment felt by many when it was found that the immense stone docks of several European cities were not to be imitated. By calculating the cost of such, it will be found that the annual interest on the outlay would raise the rental to a most exorbitant figure, and lay a grievous tax on our merchants, who in their turn would levy it upon the people, the purchasers of their wares. On the other hand, wood is cheap, and although wood and similar structures made of it are not very sightly and not very durable, these drawbacks can be borne with in view of their superior economy. But there is no reason why these objections should continue to exist. Wood can be put into form shapely enough, at least, to meet the tastes of those who go down to the sea in ships, and of those who look for profit and not the gratification of æsthetic taste on the wharves, while new and improved methods of construction and modes of preserving timber from decay—a subject not yet investigated as it should be—would afford security against the need of constant repair.

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DESIGN FOR PROPOSED LUNATIC ASYLUM.

OUR principal illustration this week is a double-page photo.-litho. reproduction of one of Mr. E. W. Godwin's designs for the contemplated lunatic asylum at S. Ann's Heath, about which full particulars were given on the 2nd August inst. and preceding week. Mr. Godwin was selected by Mr. Holloway to be one of the competitors, and he sent in two designs, each of which was awarded £50. The design as given by us bears the unmistakeable impress of Mr. Godwin's characteristic hand. The wonder to us is that Mr. Godwin should have been so near winning without carrying off the prize.

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The alterations to Cardigan Bridge are rapidly progressing, the centres for the arches having been successfully floated during last week, on the principle of the Menai Bridge, by Mr. R. Williams, of Carmarthen, the manager. During the building of the arches on the Cardigan side, lighters, &c., will pass through the two unobstructed ones on the Pembrokeshire side.

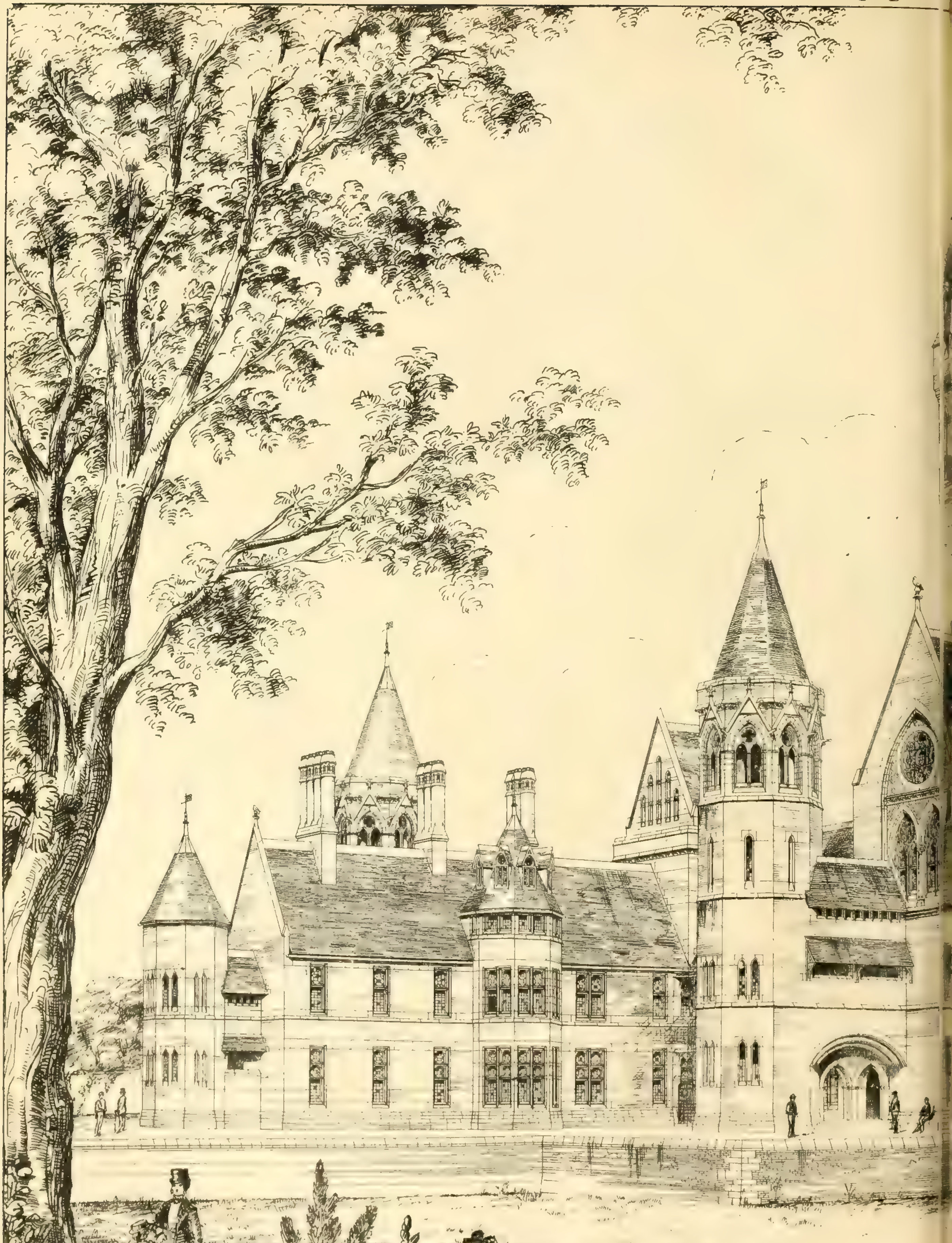
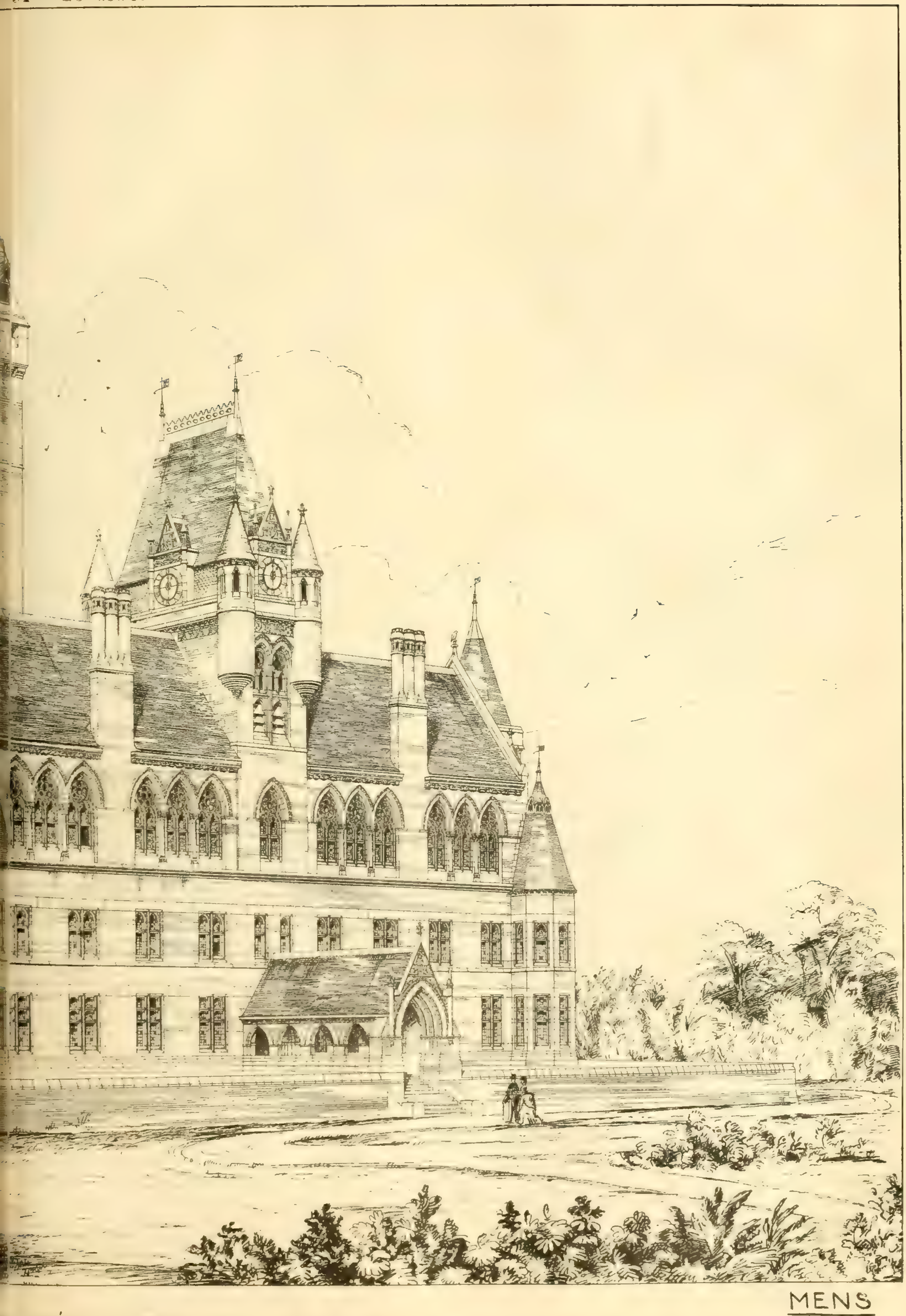


Photo-Lithographed by Whiteman & Bass 236 Holborn London

PROPOSED LVNATIC ASYLVM

BY E W.



MENS

ANN'S HEATH — PERSPECTIVE VIEW

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THE RIGHTEOUSNESS OF WRATH.

It is an Englishman's privilege to grumble, and one that he certainly does not allow to grow rusty for want of exercise. If our country be not invaded by foreigners, it is not for want of invitation, for we persist in proclaiming that we keep our plate at home without adequate means of defence; we suggest the very torpedoes that may make short work of our navy, point out the weak spots on our shores where an enemy might land, decry our army and laugh at our volunteers, and but that fortunately our neighbours do not take us at our own valuation, and have a wholesome dread of British pluck, proved in hundreds of fights by sea and by land, our consols would not be quoted so near to par as they manage somehow to maintain themselves. Yet as Englishmen *par excellence*, in this respect, commend me to architects and their critics, who curiously enough, are mainly drawn from their own body. It is fortunate that there is a limit to the circulation of our professional papers among the lay public, or there might be a chance that, most justly, by their own showing, all future commissions would be withheld from the members of a profession so utterly out of harmony with the age, so bereft of common sense, and incapable of executing any thing that is wanted either practical or artistic. The jeremiad of "G. H. G." in a recent number of this journal has brought this class of complaint to a crisis. Even the wrath of many of its correspondents, including myself, "righteous" as he deems it and oft repeated, he finds to have failed in producing effect, and so he has emptied a vial of his own, the contents of which are double distilled and alarmingly concentrated. The little breath that is left in me after its perusal I venture now to devote to a somewhat unwonted task, and in behalf of our much abused class, to implore that we may be heard, even though struck by the hand of justice, untempered by mercy. It may be that I am a biter bit, but whether I have missed it or not, my aim has always been to discriminate between the possible and impossible, and not to drive maddened victims to the brink of a cliff whence the inevitable leap must lead to annihilation. I recognise, even though I may deplore, the constitution of all classes in modern society, and see that with diversity of minds, must be, whether it be liked or not, a corresponding diversity of opinion. I look upon the present condition of the English Church as holding out a wholesome warning against too frankly exposing one's own weaknesses, for while its pale is wide enough to allow reasonable latitude to High Churchmen, Broad Churchmen, and Low Churchmen alike, all of whom might amicably agree to differ, their enemies have raised the cry, the thought of which has been bred from the wish, that disestablishment is the only cure to be applied to it. Architects may likewise once too often cry stinking fish to their own wares, and to their chagrin and disappointment find themselves taken at their word, and their goods left upon their own hands.

According to "G. H. G." the contradictory and unsettled state of architectural art, its want of accord and sympathy with scientific progress and modern society, and the conflicting views of some of its leading professors, is attributable to the education which our architects receive, and under which it is impossible to produce a race of independently-minded, competent, and original thinkers or artists. Is it so sure that all these woes and shortcomings, granting for the moment they exist, do arise from this lack of education? Why, no other age has had any such opportunities for instruction—self-instruction it may be—as the present, and yet architects worthy the name have existed. We have works amongst us which excite our warmest admiration, but we know nothing of the school in which those who produced them were brought up. Can any culture make a silk purse out of a sow's ear? Perhaps a dozen, or at most a score, of the names of architects have been preserved to us through all history, ancient and Mediæval, and the directories of the present day may chronicle as many thousands. The Institute, the Architectural Association, and the various provincial societies, each boast of their several hundreds of members, and is it conceivable that any system of education could make them all independently-minded, competent, original thinkers or artists? The truth is that the public in former ages was more discriminative, and found out and employed the few good men they had, and did not expect to hatch Phœnixes by the covey, by any patent process whatsoever. "No other profession," we are told by the same authority, "but the architectural is so ice-bound and trammelled by precedent, custom, and conventionality; no other so cramped in the application of scientific principles and knowledge." I had thought that the legal profession had been long in the throes of projected reform, but that as yet the labours of that mountain had resulted in a few very insignificant mice, and I have not heard that the light of modern geological research has as yet been frankly accepted by the clerical profession. Our cousins, the civil engineers, may have more freely made use of some of the modern appliances, but they have not as yet shown much artistic ability in the manner of so doing. For my part, I think it fortunate that some trammels have restrained the license of some of our more ardent spirits, and if I have occasionally lifted up my voice in the tones of reprobation, it has been when the desire for novelty has, to my mind, misled its votaries. Certain popular well-to-do architects are the next called over the coals for dragging their followers through a stage of antiquarian deadness, and for favouring particular types and models, irrespective of merit or suitability. Blame is here pretty equally proportioned between those that are led and those that lead, but has it not ever been, and must it not be, that some must go first and the rest follow? All cannot be strikingly original, and every style that has flourished has been founded upon those that have preceded it. Even in the matter of striking out fresh plans for churches, it will be difficult to find anything absolutely new under the sun, and we have countless failures in this direction among the works of the last three centuries and of the Nonconformists in this to make us beware lest speed should not prove the necessary accompaniment of haste. I do not say that invention and devising is not in this and many other matters to be encouraged, but I do say that it is absurd to expect the majority of the profession to do so. The best thing that they can do, if they will not take to the trades for which they are better suited, is to copy this or that school, or this or that fortunate brother, for their inventions will only make present confusion worse confounded.

If from the curriculum of education for this profession the measurements and study of old examples is to be erased, even Utopia would benefit little by the result of so newfangled a system. "Practical utility, fitness, proportion, and other qualities of art," are, in my opinion, best learnt by their means, for common sense was the basis of the success of Mediæval architecture. "Bygone conclusions" need not and should not be "accepted without proof," but most modern and even engineering works are more likely to furnish examples of what to avoid than novel conclusions of a character to be taken as precedents. The welding of modern use and ancient precedent which is rightly demanded will be wrought out, if at all, by the few first men of the day, and to them, therefore, "G. H. G." should address himself, for the majority of the profession on whom he would rely will have, despite all the education he would found, to follow their leaders as of old.

J. P. S.

SANITARY SCIENCE AT THE BRITISH ASSOCIATION.

A paper "On a Proposed Method of Preventing the Fermentation in Sewage and the Formation of Sewer Gases," by W. J. Cooper, was read this week before the Chemical Section of the British Association. The noxious exhalalations arising from the drains of our large cities are daily increasing in volume, and unless some immediate action be taken in order to check the progress of the nuisance, very serious damage to public health will be certain to ensue. If a perfect system of drainage (in London) should ever be brought about, as it involves the entire reconstruction of the sewers, it would be many years before the work could be accomplished, and a generation might perish in the interval from the lack of proper sanitary precaution. It is to chemical agency alone we must look for assistance in this dilemma, and it is perfectly practicable to arrest the fermentation of the sewage during its progress through the conduits, and so prevent the evolution of the gas. Whilst treating the roads and streets of London and other towns during the last four years with a chloride of calcium mixture the author found that the waste solution running into the drains has had the effect of preventing the unpleasant ammoniacal odour which it is so desirable to remove. This led him to further experiments, and he is convinced that at a very moderate cost (about one shilling annually per head of population) the sewers of London and other large towns could be rendered perfectly free from gaseous vapours. He proposed to apply a chloride of calcium preparation in a powdered form, or in solution, to the openings immediately in connection with the sewers, at times when the sewers are nearly empty, and especially in times of drought. The effect of chloride of calcium upon carbonate of ammonia causes the decomposition of the latter, and the formation of the neutral sorts of chloride of ammonium and carbonate of lime. But by treating the sewers at proper times with a chloride of calcium mixture, the generation of ammonia and its accompanying products of decomposition would be prevented.

Mr. Wanklyn, in opening the debate, questioned the statements made in the report of the committee appointed by the British Association to consider this subject. He distrusted entirely the conclusions drawn by the committee as regarded hydrogen, and believed that the report was valueless.

Dr. Langstaff agreed that the evils pointed out were very great. He believed that sewage gases might be easily disposed of by passing them through the shafts of factories. He had tried the experiment, and the noxious gases had thus been rendered perfectly harmless. The sewage question was the great subject of the day. In the first place it was connected with the sanitary condition of the country, and it was also a matter of great importance as an economical consideration. The application of chemistry to agriculture was a question of the first moment if by such application they could double the produce of the country. When agriculture was carried on throughout the country on chemical principles the land would produce three-fold the quantity, but unfortunately they had to deal with a class of persons very slow to move—the farmers—and who, as a body, did not possess sufficient capital to do what was necessary to develop the resources of their farms. The great thing to consider was, how to get rid of the noxious sewage gases, and the report of the committee failed in giving any information as to how this was to be done. What they wanted to know was whether sewage could be applied with profit, but the committee's report did not give any information on this branch of the subject.

Professor Williamson defended the committee, who had gone into the matter very thoroughly and made many valuable experiments. If the committee did not agree with Mr. Wanklyn it was because they had reason for thinking otherwise. He was sorry Dr Langstaff had not read the report he ventured to criticise. The experiments made showed that of the 100 parts of nitrogen contained in the sewage 40 per cent. was absorbed by the plants, and 10 per cent. went off in the effluent water. Thus there remained half of the gas unaccounted for, but there was no doubt that the soil absorbed the greater part of the 50 per cent., which enriched it to a considerable degree. However, this question would be the subject of further experiment.

Admiral Ommanney, as one of the Conservators of the Thames, complained that that body were not able to enforce the very loose law embodied in one of their Acts, which said that the River Thames was not to be polluted. All their efforts were unavailing, but Oxford was the worst offender. They could do nothing with Oxford. Then they spent £1,000 in trying to force Kingston to cease polluting the Thames with sewage, but a sapient jury, after going to Kingston to see for themselves, gave as their verdict that the obviously noxious matter always to be seen by Kingston Bridge was not offensive. He hoped that the time would come when local interests would be overborne for the public good.

Mr. Hope said a friend of his had asked the First Commissioner of Works in Parliament a question, which was answered in the affirmative, to the effect that the ratepayers in the metropolis were made to pay for pumping the sewage into the Thames, and then had to pay for dredging it out again. He thought that the Thames Conservancy Act ought to be amended to get rid of this anomaly. Sewage applied to land had resulted in increased crops. He had experimented on his own land in Cheshire, and had grown sufficient grass and hay on one acre to keep four cows instead of only being able to keep one cow to every three acres. He was trying to grow with sewage irrigation 100 tons of grass to the acre. He had not yet succeeded, but hoped to next year. They had been rather hard on the farmers, who were really an enterprising class of men, and he should recommend Dr. Langstaff to read the report he complained of quietly, and he would find the information for which he sought.

Mr. Bohn remarked that the authorities at Twickenham were liable to be fined £100 a day for not doing anything with their sewage, which at present ran into the Thames. They had made no progress during the six years they had devoted to the consideration as to the disposal of the sewage. The Conservators told them to do this and that, but they ought to tell them how to do it. He suggested that a Government commission should be appointed to recommend some plan.

Professor Corfield said that the report showed how far irrigation farms purified sewage, and as to the disposal of noxious gases through shafts of factories, this plan had more than once resulted in dangerous explosions. The committee were not bound to bring forward any plan, but they published facts, which the public must put together and utilise for themselves. He did not believe that typhoid fever was the direct result of sewage gases. He had traced many cases, and found that the cause of fever was to be discovered in the cistern water, poisoned by the gases which came up the waste pipe from the sewers and impregnated the water.

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SERPENT MOUNDS.

Mr. J. S. PHENE, F.S.A., read a paper before the British Association on some evidences suggestive to a common migration from the East, shown by archaic remains in America and Britain. He first referred to a paper read last year at Edinburgh, on some remarkable mounds in North Britain, which he considered to be identical with the serpent and alligator mounds of America. Since then he had opened the most perfect of these mounds, and obtained very interesting and satisfactory results. Drawings were exhibited, and Mr. Phené stated that, on reducing the mound to scale and taking the various levels, he found that it agreed almost entirely with the Egyptian Urœus and the Phœnician serpent deity, each of which was represented in relics now extant, as in the precise position of the mound, and each with the solar disc at its head, corresponding exactly with the cairn formerly described as the head, but now found to be in the position of resting upon it, assuming the figure to be placed vertically instead of horizontally. His observations on this point also explained the only ambiguity in the case of the great American serpent mound at Ohio, which, he also argued, is surmounted by the solar orb, thereby agreeing with the Egyptian, Phœnician, and British representatives. The subject was illustrated by examples of the modes of constructing these monuments common to each country, especially the modes of excavation and erection, which agreed in each case in Egypt, America, and Britain, arguing from this one common origin, custom, and migration. He quoted Mr. Ferguson to show that the theory he advanced was the most probable course by which America could have been visited by the mound builders of the east of Europe, who might with equal reason have spread to Britain. The words OB, meaning serpent, and ON, the sun, represented the sun and serpent deity commonly worshipped in Egypt and Phœnicia. The same word, with the addition of the letter I, was found in Africa, OBION and OBONI, representing serpent and solar deities, objects of worship. Places with these component names were extremely rare, occurring once only in Europe, four or five times in Asia, where the worship of the sun and serpent still continued, and only once in America. He claimed also that OBAN, the town near the Argyllshire mound, meant the places of the serpent and solar deity

THE PORTLAND BREAKWATER.

SOMEWHAT earlier in the season twenty-three years ago his Royal Highness Prince Albert laid the foundation stone of the Breakwater at Portland, the finishing touch of which was given a fortnight ago by his Royal Highness the Prince of Wales. This national undertaking, the cost of which was originally estimated at just under £600,000, and which has cost a trifle more than double that amount, notwithstanding all the advantages of cheap—*i.e.*, convict—labour, was originated by the report of a committee of the House of Commons, appointed as long ago as 1843, to consider "the shipwreck of British vessels and the preservation of the lives and property of shipwrecked people." As a result of the action of this committee the Conservative Government appointed a Commission in 1844 on the specific question of Harbours of Refuge. This Commission, after a most careful consideration of the whole subject, recommended as of pressing importance the construction of a harbour in Dover Bay to shelter 520 acres of anchorage up to low-water mark, or 380 acres outside the two-fathom line; a breakwater in Seaford Roads to the west of Beachy Head, sheltering an area of 300 acres; and a breakwater in Portland Bay sheltering an area of 1,200 acres. The order of importance assigned by the commissioners was (1) Dover, (2) Portland, (3) Seaford, and it is almost unnecessary to say that the latter has never been so much as touched, probably owing to the immense cost that would be incurred by bringing to the line of the chalk cliffs of the southern seaboard more durable materials than the substance which the experience of nearly twenty-two years since, when a portion of Seaford cliff was blown down by a party of Engineers, proved to be incapable of resisting the action of the waves for more than a few tides. The works at Dover are still unfinished; those at Portland have just been completed.

Breakwaters are by no means modern inventions. Nature has set many an example in the promontories which provide a natural and secure anchorage in so many places round our own coasts, and in the reefs which form a line in front of other shores; and this example we know to have been copied in Roman times by the making of artificial islands in front of harbours which were exposed to the full force of a long run of sea. But to the French nation belongs the distinction of attempting to create a breakwater on really scientific principles. The great naval port "inaugurated" just fourteen years ago by the Third Napoleon was the result of the ceaseless action of no fewer than ten successive Governments in France; and the breakwater at Cherbourg, in which experience of the action of waves on submarine embankments was dearly bought, was at once the first and most costly of modern structures. Over and over again the sea ruined in one night the labours of years, and we have reaped the benefit of the perseverance which was certainly, in the first instance, directed as much against our maritime supremacy as against the stormy sea, which rendered the splendid natural roadstead at Cherbourg unsafe as a military port. The day on which we took Magdala was rendered memorable in the history of our harbours of refuge by the loss of one of our gun brigs, which was driven from her anchorage on Easter Monday, 1868, right under the protection of the pier breakwater at Dover. But no such accident is well possible at either Plymouth or Portland. The former possesses our oldest breakwater, and, strictly speaking, our only one; for the Dover Embankment is a pier, and the Portland Breakwater is a pier with a wide opening in its middle. The work at Plymouth utilises a low natural reef which runs across the entrance of the Sound, on the rocks being deposited the stones which rise to the surface, where they are faced with masonry on such a slope that when there is a sea on, the waves break clean over the embankment, and cause no small disturbance even as far as the dockyard. Many a scientific discussion has been held as to the proper construction of breakwaters, but the Commission of 1859 on the Harbours of Refuge brought to light many important facts, which establish the theory that the waves themselves determine the best and most enduring slope of the stone deposit, and as the action of the waves differs at different points of the coast line, it would be impossible to lay down any rule as to the angle which the breakwater should present to the sea. It seems to be placed beyond doubt that the scouring action of the waves never exists on our shores below a distance of fifteen feet from the water level, and that when successive storms have worked an embankment to a particular slope no subsequent scouring of the sea produces upon it any appreciable change. Thus it happens that the Portland Breakwater has not been completed according to the original plan of the late Mr. Rendel, who was assisted as resident engineer by Mr., now Sir John, Coode, appointed at Mr. Rendel's death as engineer in chief, but practically superseded six years ago by Colonel Clarke, R.E., who has been responsible to the Admiralty for the completion of the works. These were begun in August, 1847, so that just five and twenty years have been consumed in the operations. The first vote was taken in Parliament in the session of 1846; the Act empowering the acquirement of lands, &c., was passed in May, 1847; the late lamented Prince Albert sunk the foundation stone on July 25th, 1849, and the sinking of the stone was fairly begun on the 11th December in the same year. Any map of England will show that the Isle of Portland, or rather the head of the peninsula which is connected with the Dorset coast by the famous Chesil bank of pebbles, has a slight bulge to the north-east, where the shingle bank terminates. Here starts a pier running due east for some 1,800ft. Then there is a passage of 400ft. in width, with a minimum depth of 45ft., to allow the entrance of vessels from the southward. On the other side of this passage the real breakwater starts on its length of about 6,000ft. The rubble of which it is formed consists of the cap stone, almost worthless in itself, which covers the really valuable quarries of Portland stone, and is in the way of those working the latter material. The rubble includes stones of all sizes, from six or eight tons to mere chippings which the water has driven in between the larger blocks until they have been united into an almost solid mass. The rubble, both for the pier and the breakwater, was brought down inclined planes by the aid of wire ropes, and thence conveyed in waggons propelled by locomotive engines along a railway formed on staging which was pushed forward as the foundation grew, the gap of 400ft. between the inner and outer embankment having been bridged by a structure of wood, which, for all its apparent slightness as seen from Weymouth Bay, stood the storms of years and the continual heavy traffic until the work was accomplished. The stone was quarried and loaded almost entirely by the convict labour, there having been from four to five hundred prisoners continually employed, chiefly on top of the cliffs. About a hundred men, sometimes more, sometimes fewer, were employed in the actual work of construction, at wages which form a very considerable proportion of the total cost. About six millions of tons of stone have altogether been sunk in the formation of the pier and its adjunct, the breakwater proper.

This portion of the structure consists of a rubble mound carried up to a few feet above the level of high water in spring tides. When it had been washed by heavy seas until it settled into shape, a trench was excavated within the body to the level of the low water of spring tides, and a wall of masonry erected therein. The face course is formed of large ashlar blocks, the body of the wall being heavy rubble work, set in mortar made of blue lias lime and pozzuolana, a volcanic ash from the vicinity of Naples, used in the composition of the best cement. The courses up to 6ft. above high-water level are hewn granite, and the rest of the face is the best stone from the neighbouring quarries. The sea wall is strengthened by counterforts 20ft. apart, and an arch being turned between each, a platform is obtained 15ft. in width, exclusive of the footway and the parapet. The pier and the breakwater, the rubble mound of which has now been for years at rest, protect an area for anchorage or coaling for men-of-war of 1,290 acres outside the five-fathom line, 1,590 acres between three and five fathoms, 1,758 acres between 12ft. and 18ft. and 210 acres up to low-water level. Thus we have a magnificent harbour, believed to be perfectly safe in any condition of weather or waters, and capable of holding nearly all the navies of the world.

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THE BRIGHTON WATERWORKS.

Mr. E. EASTON remarked, in reading an explicit paper on this subject, before the British Association, that when an engineer was called upon to design works for the supply of water to a town, the first question he naturally solicited information upon was from whence water of pure quality and practically unlimited in quantity could be procured. In making a survey of the country surrounding Brighton one was struck with the entire absence of all streams and sources of water. In the chalk stratum, however, streams of excellent water flowed into the sea. Brighton had been supplied with water from time immemorial from wells sunk into the chalk stratum. Those wells were resorted to until the year 1832, when a company was formed and established waterworks. A well was sunk on the Lewes road, and the water obtained was pumped into a reservoir, and then distributed by pipes through the town. It being soon found that a single pump was insufficient to supply the inhabitants, other pumps were laid. In 1852, in consequence of great complaints of a scarcity of water, a new company was formed, which, in the following year purchased the works of the old company. It was soon discovered that the wells and tunnels were totally inadequate, and the company, under the direction of his father, commenced a new series of tunnels on the principle adopted at Ramsgate. Brighton was similarly situated to Ramsgate, being on a succession of chalk downs, untraversed by any river or stream. Throughout the whole district there was no system of agricultural drainage, and none was required, in consequence of the porous character of soil. Though the chalk was as absorbent as sponge, it was unready to yield up what it had consumed. Speaking generally, the water in the chalk attained its highest level in March of each year, and sunk to the lowest from October to December: the chalk, therefore, acted as a surface reservoir. Up to 1865, the whole of the town was supplied from the Lewes-road works, but in that year, in consequence of a great demand for water, a well was sunk at Goldstone Bottom, which was a naturally formed basin in the chalk, the lowest side being more than 60ft. higher than the water of the basin. Nearly 160ft. was sunk without any fissure being discovered, but soon afterwards one was come upon from which nearly a thousand gallons of water issued per minute. Other fissures were found, and the fluctuations in the supply were not great. The total length of the tunnels at the Lewes-road works was 2,400ft., and that of those at Goldstone Bottom 1,300ft. Having thus adverted to the source of the water supply, Mr. Easton gave an ample description of the pumping force at the works. He then stated that the district was divided into four zones or services, and the supply amounted to two and a half millions in the summer, and three millions in the winter per day. The water was supplied on both the intermittent and the constant system, the number of constant service customers being about 5,000. There were two distinct sources of supply, each being sufficient to yield the maximum quantity required, and capable of still further development as the town increased. Besides the reservoir storage there was always on the average a two days' supply in reserve for each zone or service.

NEW THEATRE AND OPERA-HOUSE, ABERDEEN.

A NEW theatre and opera-house is in course of erection at Aberdeen, and is interesting as illustrating the constructive capabilities of concrete in a direction somewhat out of the beaten track. As readers of the Building News well know, concrete has been very largely used of late years for constructing retaining walls in railway cuttings, and also for the erection of the walls of cottages, railway sheds, warehouses, and gardens, but the new theatre at Aberdeen is, we believe, the first building of its kind in which that material has been so largely used. The site of the building is in Guild-street, about midway between Stirling-street and Carmelite-street. Its length is 74ft. 8in., and its mean depth to Trinity-street, 90ft., the height of the front being 50ft. from the street. The bases and piers of the façade are of white pick-dressed granite, and the columns are of polished Peterhead granite, with capitals and stringcourses of Newton freestone, the arching of the doors and windows being of white pick-dressed granite and red sandstone from Turriff, filled in with white ornamental bricks. The style is Gothic. The side and party walls are all of concrete, consisting of 8 parts gravel and sand and 1 of Portland cement. There are two shops in the façade, one 17ft. by 11ft., and the other 21½ft. by 17ft. There are five entrances for the public, all in the front. The stage entrance is in Trinity-street. Commodious refreshment and retiring rooms are provided for every class of visitors. The auditorium is of the horseshoe form, and will be lighted by a sunlight. The proscenium is 28ft. wide. The fronts of the boxes and balcony will be of ornamental open ironwork. The theatre will be seated for 1,680 persons, but will accommodate 1,800 on an emergency. The stage measures 53½ft. in length, and has a mean depth of 29ft., the scene-dock being 16ft. by 14ft. The joint architects (according to the *Aberdeen Journal*) are Messrs. C. J. Phipps, F. S. A., London, and Matthews, Aberdeen. The contractors for the concrete work are Messrs. Drake Bros. of London; for the mason work, Mr. Bisset; for the carpenter work, Messrs. Wamack & Daniel; and for slater work, Mr Davidson, Aberdeen. Mr. William Brown is clerk of the works.

WELLS FOR WATER SUPPLY.

AS there seems to be a growing tendency in some parts of the country, and for large institutions, such as workhouses and asylums, to rely upon wells for a supply of potable water, the following remarks by Mr. G. W. Usill, A.I.C.E.,[*] on the sanitary and engineering aspects of the subject will be worth attention.

It is somewhat difficult to classify wells, as (with the exception of those which overflow) the general principles are very much alike. The most common form of ordinary wells are those known by the name of "shallow wells," which are dependent upon surface drainage, and exist under similar circumstances to the land springs—viz., a mere superficial porous stratum resting upon clay or other retentive material whose form is depressed or basin-shaped. The supply to such wells is regulated by the rainfall, and the quality of the water is liable to be impaired by the infiltration of foreign and deleterious matters from the state of saturation in which such strata exist in or near to towns. Mr. Usill thinks that it is the imperative duty of engineers to use every means in their power to discourage the system of independent supplies of water from such sources as this, for recently there was an outbreak of typhoid fever at Burbage, in Leicestershire, the cause of which was unquestionably the impure quality of the water contained in the village wells. Out of a population of 2,000 inhabitants 100 were seized with the fever, of which number 15 succumbed to its ravages. It was found that all the sufferers had drawn their supply of water from a well immediately adjacent to a privy. Such instances are, unfortunately, but too common. It may be all very well for manufacturing or culinary purposes to obtain a supply of water close at hand, but seeing that week by week fresh instances occur of the baneful results accruing from human beings drinking the water from such sources, it is high time strong and sweeping measures were adopted to put a stop to such practices.

The second class, or deep ordinary wells, derive their supply under more extended circumstances, being generally sunk down to some water-bearing strata, such as chalk, sand, and limestone, &c., and, like springs, they are affected by the geological structure of the earth, the nature of the strata, and the extent of the area contributing to their supply. The circulation of the water for the supply to wells of all classes is assimilated to that of springs. The amount of porosity of the permeable rocks, the nature of their dip, and other conditions, all tend to increase or diminish the quantity. It does not necessarily follow that an abundance of water will be obtained, even by sinking down to a water-bearing strata, for even in the most open of the porous rocks, friction and capillary attraction offer impediments to the downward progress of the water; and although chalk and sandstones are the most absorbent of rocks, yet heavy pumping and extraction of the water may cause a falling off in the supply. The extent of the supply to wells is regulated by what is termed "the cone theory," whereby the quantity of water contributed to a well is assumed to be equal to the volume contained in an inverted cone whose base represents the surface of the ground, and whose apex is the bottom of the well. The sides forming the cone are the limits of the inclination of the drainage of the water, and are more or less acute in angularity according to the nature of the strata. Mr. Stephenson, in speaking of this question, says:—"The process of pumping in time renders the angle formed by the sides more and more obtuse, until an inclination is established where the friction of the water, in moving through the pores and fissures of the rock, is in equilibrium with the gravity of the plane."

The supply to wells sunk into a compact strata is very often augmented by driving headings or adits horizontally in different directions at the bottom of the well, whereby a lodgment is formed for the water, which has a corresponding effect to deepening and thereby increasing the drainage area. Professor Ansted is of opinion that no deep wells should be sunk within a mile of one another.

Artesian wells (so-called from the success that has attended their adoption in Artois, in France,) are properly overflowing wells or artificial springs. The general custom is to sink a well for a certain depth and then bore down to some water-bearing strata, when the water, being held as it were in a permeable strata resting upon and under an impermeable strata, is under pressure, and as soon as the retentive stratum has been pierced the water will ascend to a height corresponding with the line of saturation. These wells are very numerous in and around London, whose geological conditions closely resemble those of Paris.

Wells sunk down at any point near the lowest part of the depression will receive a copious supply of water, seeing that the level of the outcrop is at a greater height. It often happens, however, that the levels of various wells sunk into a water-bearing strata are affected by the existence of faults in such strata, and it very frequently happens that after a great depth has been attained, the existence of a fault will render the operations useless.

A NEW TAR PAVEMENT.

A NEW process for making serviceable tar pavements has been recently patented in America. The purpose of this invention is to furnish a new and improved composition, whereof to make sidewalks and the like, which shall be free from objectionable odours, not liable to injury from rains falling on it soon after it is put down, and which, it is claimed, has other incidental advantages. It is made principally of equal parts of coal-tar, pitch made from coal-tar, and asphalte, to which is added gum camphor, in the proportion of 3lb. to each barrel of coal-tar. The coal-tar and pitch are melted together, and the camphor added thereto. The asphalte is melted separately, and then mixed with the other melted ingredients. In laying down the pavement a substructure of about 2in. of small cobble-stones is laid, ranging in size from about the size of a goose's egg to the size of a robin's egg, and previously coated with coal-tar by pouring the tar over them and raking them about. This is rolled down first with a roller about 22in. long, weighing about 500lb., and afterwards with a roller about 24in. long, weighing about 800lb. Screened sand is next mixed with melted tar, pitch, asphalte, and camphor, till the whole forms a stiff paste, which paste is put upon the substructure sufficiently to cover it when subsequently rolled, first with the light roll and then with the heavy one, to about an inch in depth. When well rolled the surface is sprinkled with water-lime to the depth of about one-sixteenth of an inch, which is rolled into the paste with a light roll. The inventor claims that the combination of the tar, pitch, and asphalte, makes the most durable composition for this purpose yet known. The proportions given will best fulfil the conditions required; but they will approach this result in any combination. The camphor deprives the whole mass of bad odours from the first. The water-lime forms a thin scale over the walk impervious to water, which will not wear away till the walk is sufficiently hardened to resist all action of the rain without this protection. These "tar" paths make excellent substitutes for gravel, and are being extensively used in one form or another for various public works.

SCHOOL BOARDS.

Bradford.—The plans of Messrs. Andrews & Pepper for new schools in Undercliffe-street, Barkerend, have been accepted by the Bradford School Board. Accommodation is to be provided for 500 children, at an estimated cost of £9,250. The Board have also accepted the plans of Messrs. Knowles & Wilcock, for schools in Lorne-street, Wakefield-road. About the same number of children will be accommodated as in the Undercliffe-street Schools, the estimated cost being £8,500.

Hastings.—At a special meeting of the Hastings School Board, on Tuesday last, the plans of Mr. Thomas Elworthy, of S. Leonards, were accepted for new school in Waterloo-place, subject to approval by the architect to the Education Department.

Scarborough.—At the last meeting of this Board the clerk read the following report from the committee appointed to consider the plans of the above school:—The committee of the whole Board beg to report that they have carefully inspected the designs (19) submitted by the competing architects for the proposed central Board School, and they are of opinion that the plans sent in by the following architects are the best, viz.,—(1) Mr. Thos. Oliver, Newcastle-upon-Tyne, estimate, £5,500; (2) Messrs. Stewart & Bury, Scarborough, estimate, £3,850; (3) Mr. Wm. Watson, Wakefield and Doncaster, estimate, £4,650. The committee recommend, therefore, from the above the final selection should be made by the Board. The report having been adopted, Mr. Rowntree proposed, and Canon Blunt seconded, that the plans submitted by Messrs. Stewart & Bury be accepted, subject to the same being approved by the Education Department, and also subject to the condition that a tender from a respectable contractor for the execution of the works within 10 per cent. of the amount of the estimate accompanying the plan be obtained. On being put to the vote, there were 7 for the motion and none against it. The Chairman and Canon Walker did not vote; it was carried *nem. con.*

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[*] In a paper read during the past session of the Civil and Mechanical Engineers' Society.

ARCHITECTS AND COMPETITIONS.

If an ordinary person, says the *Birmingham Morning News*, who fancied that he was ill, obtained a dozen prescriptions from as many physicians, and placing them on his table should endeavour to determine which one was the best by a comparison of the handwriting, he would be quite as likely to arrive at a sound conclusion as any committeeman can be who looks over a dozen sets of architectural drawings in as many minutes, or even in as many hours. But there is no denying that people don't think so, and particularly those people who manage parish matters. They are accustomed, before they decide on a special contractor, to have samples submitted to them, and they taste the cheese or try the sugar, or inspect the boots submitted to them, with very great interest and pleasure. What, therefore, can be more natural than to ask architects to submit their "samples" also; as it matters nothing to the gentlemen requiring this submission that in the one case it is easy to cut off a pound or two of cheese, or to wrap up and deliver a few ounces of sugar, and that in the other case, the preparation of these drawn and coloured "samples" calls for the expenditure of whole weeks of time and some amount of money for wages? But the most curious notion of all is that architects really like this treatment, and that it is a pleasure to them to pursue a course of conduct which any ordinary physician or lawyer would decline to follow, with praiseworthy indignation. People who defend competition constantly say that architects are hurt or injured if they are not "invited to compete" whenever there is sixpence to be spent over a building; and they positively talk as if they were forwarding the best interests of that profession by issuing these invitations.

They may be right, but if they are, then of all men architects are the most fantastically pleased. Who is to know what strange matters will give pleasure to men if this custom is pleasing to its victims? Architects must, if this is true, look upon life with very different eyes to those of most men. The lawyer or the doctor expects that his reputation will grow with his own length of work. He thinks, and indeed he knows, that his good work of to-day will bring him more and better work upon the morrow. He finds by experience that men will value able work when it is brought to their notice, and his first and last, his constant and best aim, is to acquire a good reputation. But if the popular verdict is a right one, a good reputation is of no possible use to an architect. He is always to be beginning afresh. His past deeds are to stand him in no good stead, but he is only to have the privilege of starting in a race at his own expense, with unknown competitors, and with no efficient judge standing at the winning-post. The history of public architectural competitions is simply the history of public scandals, and we confess that we can in no manner understand these strange men who consider they belong to a profession, and yet fight, and struggle, and scold, and intrigue to gain some paltry prize, at the cost of much work and continual vexation. As for the town, it grows uglier every day, and a multitude of respectable old buildings have given place to designs which are new, and yet more marvellous than they are new. To give up letter writing, and touting of any kind, and to betake themselves to studying the rare art of artistic design, seems to us so wise a thing for architects to do that we can hardly venture to hope that they will follow such excellent advice.

POLISHING FLOORS.

Dissolve three ounces of potash and four drachms of catechu in four pounds of boiling water, in an earthen pot. When these ingredients are dissolved, add two pounds of water and boil again, stirring in four ounces and a half of yellow wax with a wooden rod. Continue boiling until all the lumps of wax disappear. Let cool, and add three pounds more of water. In this condition it is ready for use. By boiling the wax and potash together, a soluble wax soap is formed, so that a floor waxed with this preparation may be swept, and cannot be washed with water, for that would dissolve off the soluble wax soap. For this reason an oil paint is preferable to wax polish, the only advantage being that it dries quickly, while oil paints require a long time, during which the room cannot be used.

For painting floors the mineral paints are exclusively used. Paints which contain white-lead are too soft, and wear off very easily. If a floor painted with oil colours wears off unreasonably fast, it is sure proof that the paint contained white-lead. This generally happens because such colours cover better and are more easily applied. Even the use of varnish boiled with litharge is to be avoided, and one boiled with borate of manganese preferred. As a rule, it should have two coats, but the greatest care should be taken that the first be perfectly dry before the second is put on. After the floor has been painted, in order to give it a polish and make the surface more permanent, it is coated with what is called "floor lac," which may be made thus: Dissolve one ounce of shellac in one quarter pound of 80 per cent. spirits, and add to the solution one drachm of camphor, and strain out the lees in a linen cloth. This lac is used after the paint is dry, and gives more tenacity to the surface. A fresh coat of lac may be applied from time to time as it wears off, and you have always a fine polished surface which can be washed.

THE HARTLEPOOLS EXCHANGE AND CLUB HOUSE COMPETITION.

Some three or four months since the directors of the projected Exchange Buildings at West Hartlepool invited twelve local architects to submit designs, and after much deliberation and caution the New Exchange Company (Limited) have committed themselves to a definite scheme for the erection of a block of buildings, to be designated "The Hartlepools Exchange." The selected design is that bearing the motto "On 'Change," the author of which is Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, and has been chosen as being the most suitable, and as, in all respects, most nearly complying with the instructions issued by the company. The building will have three principal frontages; the style is Italian Gothic, having a handsome tower with angle turrets breaking the line of the north façade; the materials proposed to be used are red pressed bricks, liberally relieved with stone dressings. The Post Office authorities have had copies of the plans submitted to them, and from the degree of satisfaction with which the internal structural arrangements are regarded there is little doubt the new Post Office Buildings, so much needed for West Hartlepool, will form a separate department. The North-Eastern Banking Company are also in treaty with the directors for suitable accommodation here, and most of the offices in the building are already secured, on promise, by private firms in the town.

The same architects also submitted designs for a Club House for the Exchange Company, to be erected on a site facing the Exchange, and in this case also Mr. Hoskins succeeded in carrying off the prize. The building, as may be imagined, is of the same style of architecture as the Exchange. It is understood that the directors have assured themselves that both buildings can be carried out for the estimated cost, and operations are expected to commence without delay.

ARCHÆOLOGICAL.

Sussex Archæological Society.—The Sussex Archæological Society had an agreeable excursion on the 8th inst., to Parham House and Park, the residence of Lord Zouche. Mr. F. Barchard, one of the hon. secretaries, read an account of the domain. Parham House is an Elizabethan mansion, built by Sir Thomas Palmer in the latter part of the sixteenth century, the date upon the house being 1591. The mansion contains a fine collection of pictures and armour, and one of the best and most extensive collections of antiquities in the county. The great hall is a magnificent apartment, over 50ft. long, 25ft. wide, and about the same height. This room contains the arms and quarterings of Queen Elizabeth, and on the painted glass of the fine transom window are seen the arms of the Curzons (the family name of Lord Zouche), with the motto "Let Curzon holde what Curzon helde."

Antiquarian Waifs at the Charterhouse.—Last week, in taking down the kitchen of the Charterhouse, which dates back to the time of Sir Walter Manny, the following articles, among others, were found in a disused sewer beneath the foundation of the chimney:—A Roman thimble in copper, two fragments of Roman pottery, portions of flagons with handles, small head in alabaster, the features and head-dress, cap with turned up brim and conical top resembling those of King Thothmes in the Egyptian Gallery of the British Museum; two decorated spandrels, period fourteenth century, and a portion of moulding, the flutings filled in with colours. The architectural remains are supposed to have belonged to the monastery of S. John of Jerusalem. It is conjectured that the head formed part of a statuette which might have been brought to England by one of the Templars on his return from the east. The remains have been carefully preserved by Mr. Perry, the surveyor of the works.

Building Intelligence.

CHURCHES AND CHAPELS.

Darlaston.—On Tuesday week, the parish church of Darlaston, which accommodates from 1,300 to 1,400 worshippers, was reopened after its restoration. The church, which was entirely rebuilt, except the tower and spire, is in style Pointed Gothic, modified, and consisting of chancel, north and south transept, and nave, and north and south aisles, the exterior walls being cased with Codsall stone, with Greenshill stone dressings, and the roof covered with Broseley tiles, the ridge surmounted with red crests. The total cost of the building will be about £4,000. Mr. A. P. Brevitt, of Darlaston, was the architect, and Mr. Lovatt, of Wolverhampton, the builder.

Dundee.—The work of restoring the unique and picturesque old church tower seems in danger of being interrupted if further subscriptions to the restoration fund are not forthcoming within a month. About two-thirds of the tower have been renovated to the satisfaction of all concerned, but a good deal of carving and other work remains to be finished. About £2,448 has been paid for completed work, leaving a balance on hand of £1,317. It is estimated that the cost of completing the work would be £2,737 odd. It is to be hoped the merchant princes of bonny Dundee will at once contribute to finish the work so well begun.

Hatfield.—Hatfield Church, near Thorne, has lately been reopened, after restoration under the direction of Mr. T. G. Jackson, architect, of London. The church is cruciform in plan, with nave and aisles, north and south transepts, chancel, large chancel aisles, and central lantern tower, and the unusual size of the church, its lofty and spacious proportions, and the excellent design of the several parts, render it a really magnificent structure. The earliest existing work in the church dates from the twelfth century. The great west doorway, with its receding orders and shafts with sculptured capitals, is a fine, though simple, example of Late Norman work, and the west front still contains one of the narrow elongated lancets with which the twelfth century church was lighted. The north aisle of the church dates from the fourteenth century; and the tower and transepts, and the whole of the eastern part of the church, including the clerestory of the nave and the great west window, were built in the fifteenth century. The magnificent rood-screen is nearly perfect, and retains its loft. Before the present restoration the church was so encumbered with high pews that little of its internal beauty could be seen; and the shifting of the sandy soil on which the church stands with very little foundation, which was caused by the sinking of innumerable graves and vaults with the most culpable disregard for the stability of the building, had caused serious settlements. The square bases of several of the nave pillars were cracked and crushed, and their four angles tilted up, and the shafts of nearly all of them were inclined both northward and westward, and the whole west front had bulged seriously outwards. Four of the nave piers had to be underpinned. New open seats have been provided, and the lantern stage of the tower has been restored to view by the removal of the ringing-floor. The eastern part of the chancel is laid with a mosaic pavement, executed from the architect's designs by Messrs. Powell, of Whitefriars, and the rest of the church is paved with tiles by Godwin, of Lugwardine. The general contractor was Mr. Wood, of Doncaster.

March.—The new Church of S. John, March, Isle of Ely, is completed. The style adopted by the architect, Mr. T. H. Wyatt, is Early Fourteenth Century, and the plans consist of nave, small side aisles, and chancel, and provision is made at the chancel end for organ-chamber and vestry. The walls consist of Ancaster stone, with Bath stone dressings, and the roof is covered with Colly Weston slate. The roof is an open one, with timbers stained and varnished; and the seats, which are open, are made of pine, also stained and varnished. The chancel is paved with Maw's tiles, of London, and the aisles are laid with black and red Staffordshire tiles. The pulpit is of alabaster with open arches. The church will accommodate 400 persons, and the cost has been about £5,000.

Morton.—The foundation stone of the new Church of S. Philip and S. James, Morton, near Oswestry, was laid on Thursday, the 15th inst. The plans of Mr. Pountney Smith, architect, of Shrewsbury, have been accepted for the work, and are to be carried out, at a cost of between £1,600 and £1,700, by Messrs. Morris & Chaplin.

Oxford.—The foundation stone of the new Church of S. Peter-le-Bailey, Oxford, was laid on Thursday week. The new church will consist of nave, chancel, and two side aisles. The body of the church will be 79ft. long and 55ft. wide, and the chancel 30ft. long and 20ft. wide. A square tower, with octagon turret for stone staircase, will be erected on the south side of this portion of the edifice, and underneath it will be the warming apparatus. The tower will be 77ft. high from the Ground to the battlements. A vestry will also be erected on the south side of the chancel. The style of the architecture is to be that of the Decorated period. The ashlar work will be of Bath stone, Box Ground, intermixed with stone from the old church and tower, and the window dressings and tracery will also be of the same kind of material. The interior of the building will be plastered. Mr. Basil Champneys, of 39, Great Marlborough-street, London, is the architect, and Messrs. Honour & Castle, of Oxford, the builders.

Tettenhall.—The foundation stone of a new Congregational chapel at Tettenhall, was laid on Thursday week. The new building will be 58ft. in extent and 33ft. in breadth, and is designed to accommodate 403 adults. The style is Geometric Gothic. The walling will be stone-faced, and the stone used will be from the Codsall quarries. The north front will be a gable, with the central doorway, and there will be a turret at the western angle 60ft. in height. The contractor is Mr. Cockerill, and the architect is Mr. Bidlake.

Wolverhampton.—Considerable alterations are commenced at S. Paul's Church, a building erected about 35 years back according to the then prevailing type—having a chancel four or five feet deep, with a vestry at the back, over which latter is placed the organ. It is now intended to remove the organ and wall screen below, thus increasing the depth of chancel by taking in the present vestry and erecting a new one on the north side of the church. On the south side will be built a new organ-chamber, with open archways towards the chancel and aisle, the lower portions being filled in with wood screens. A new stone window of five lights will be inserted in the east wall of chancel. The floor of chancel will be raised and laid with Minton's tiles. A new communion rail with ornamental iron standards will be provided in lieu of the present close cast-iron railing. The pews at the east-end of church are re-arranged with open benches and seats for the choir. The font and pulpit are to be removed from their present situations in front of the chancel, and the former refixed at the west end of the nave. The present lath and plaster gallery front is to be taken down and a lower one constructed in wood. The tender of Mr. P. Horsman at £600 for the general works is accepted by the committee, Mr. J. R. Veall being the architect.

BUILDINGS.

Devon.—The foundation stone of Dunsford Schools, Devon, which are to accommodate 120 children, was laid on the 6th inst. by F. D. Fulford, Esq., of Fulford Manor. The schools will be built with granite to harmonise with the parish church, and will have red brick and Bath stone dressings. The roof is to be open-timbered and covered with Welsh slate, surmounted in the centre by an open-framed bell turret. The walls internally will be plastered and finished in stucco. The schools will be furnished in accordance with the requirements of the Committee of Council on Education, plans having been submitted to and approved by their lordships. Mr. Alfred H. Wills, of Topsham-road, Exeter, is the architect, and the contractor is Mr. John R. Wills, of Countess Wear, near Exeter.

Exeter.—On Thursday, the 8th inst., was laid the foundation of a home for decayed licensed victuallers in this city, to be called the Licensed Victuallers' Benevolent Asylum. The site is a field of about an acre and a quarter in extent, most pleasantly situated on the Union-road, and although at present it is only intended to build a block of four cottages, the whole field has been purchased, so that at any future period additional blocks may be erected. The cottages will be Gothic in style, and built of red brick, with Bath stone dressings. The architect is Mr. Alfred H. Wills, of the Topsham-road; and Mr. J. Slade, of the Bonhay-road, is the contractor.

Huyton Quarry.—On Wednesday week Lord Derby laid the foundation stone of a new infants' school at Huyton Quarry. The proposed school, which is to accommodate about 100 children, and is to cost £1,000, will be built in the thirteenth century style. The main buildings consist of a lofty schoolroom, with side aisles, from which it is divided by arches and columns, having a clerestory above with six large traceried windows. At the east end, and raised a few steps, will be a deep recess lighted by a large triplet window; and this part of the building will form a chancel, to be appropriated to the services of the church on Sunday. The contractors for the buildings are Messrs. Cassidy, Foxcroft, & Williams, and the architect is Mr. H. H. Vale, F.R.I.B.A., whose plans were selected in a limited competition.

Lewes.—New buildings are about to be erected at Lewes, as a School of Science and Art, and tenders are invited for the first portion of the buildings. Messrs. J. L. & C. Parsons, of Lewes, are the architects.

Philadelphia, U.S.—Work is now in progress on the new building for the Pennsylvania Academy of the Fine Arts, Philadelphia. The new building will be of a modified Gothic style of architecture, 100ft. front by 258ft. deep. The front will be two stories high, of brick, ornamented with encaustic tiles, terra-cotta statuary, and light stone dressings, and laid in patterns of red and white bricks. There will be a central feature standing out from and rising above two wings. The lower story is to be 18ft. in the clear, and will contain a library (having a fireproof closet), which will serve as a directors'-room; a lecture-room, with a room at the back (not large), opening on the stage, and accessible without passing into the lecture-room; galleries for casts from antique sculpture, the windows to reach to the ceiling, and so arranged that no figure receives light from more than one window. A hall about 18ft. wide will run the entire length of the building, and will contain groups of statuary at all available points. The building will cost about 250,000 dollars, and will be as nearly fireproof as possible.

Stowmarket.—Mr. Barnes, architect, Ipswich, has prepared plans for the alteration of the Stowmarket Corn Exchange, and tenders therefor are now invited. The hall will be made six or seven feet wider than it is at present, and will then be 80ft. long by 36½ft. wide. The roof will be raised some 6ft. or 7ft. from the present eaves, and the building will be lighted by windows in the sides, and a lantern light in the roof.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions, are particularly requested to* advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Received.—C. E. A. B.—J. R. W.—G. H. G.—G. D.—H. N.—J. G. Livesey.—M. B. A.—W. F.—J. G.—W. D.—C. G.—A Constant Reader.—C. B. A.—J. A.—E. W. S.—G. T. R.

Flatilecture.—Rather too theoretical for us.

A Nine Years' Subscriber.—You are the only one out of many thousand subscribers who has expressed such an opinion.

X. Y. Z.—Most of them will appear.

J. Robinson.—In good time.

Correspondence.

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PLYMOUTH ARCHITECTURE.

To the Editor of the Building News.

Sir,—"A Plymouthian" having taken exception to our letter published in your issue of the 9th inst., will you permit us to try and substantiate our remarks with reference to the "very ordinary" nature of the recent church architecture in this neighbourhood. Of S. Paul's Church, your correspondent says "with the exception of the tower and spire, which are both stunted and had better have been left unfinished, I do not see there could well have been any improvement."

This remark alone is sufficient to bear us out as to the "ordinary" character of the building. Suitability, we contend, is one of the first things to be considered in designing; now, a church where the admission of light seems to be entirely neglected can scarcely be considered suitable for the purpose, and any design failing this cannot possibly be deemed (putting it in the mildest form) otherwise than "ordinary." This is the case with S. Paul's, which, being surrounded by tall houses on three sides, is only lit by the three windows in the west end: it is true there are three windows at the east end, but they are utterly useless, being close to said tall houses. Had light been obtained by means of clerestory windows, a very great improvement would have been the result, and the expense, which "Plymouthian" appears to think an excuse for all defects, need not have been heavier than as now executed. Again, "Plymouthian" implies that "decoration" is the main feature in architecture: this we deny; a building can be architecturally perfect in all its parts without decoration. With respect to S. James', Keyham, he states the architect "had sufficient funds for an ordinary building" which "did not allow of anything for decoration, but now that it is grouped with the vicarage and schools, I am far from thinking it 'very ordinary.'"

Would it not have been far better to have erected a plainer building which, by its good proportions and just balancing and distribution of parts, would have made up a grand whole? This is not so in the present case, neither is the tower and spire satisfactory in the relation of the one to the other; the abortive attempt at a clerestory without windows in the chancel does not tend to improvement. We merely touch upon a few facts to prove our remarks correct as to the "ordinary" nature of the architecture. Even "Plymouthian" admits that the building is not good by stating that "now" the vicarage, &c., is grouped with it, he is far "from thinking it 'very ordinary.'" Can "Plymouthian" say anything in favour of the window tracery, which is nearly all of a trellis pattern, and that is known to be "ordinary" in the extreme?

To pick the various churches to pieces, in detail, in order to substantiate the statement made by us, would involve more space, we doubt not, than you would care to bestow. What we mean principally to imply by the churches in this locality being "very ordinary," is simply that there is no originality of design about them, but merely lifeless copies of old examples (possibly from books) worked into unsuitable places, in an unsuitable manner.

S. Mary's Church, where, it is said, the architect had £14,000 to work with, is not even equal to S. James'. The whole building is greatly wanting in height, and the tower, which has a spire and parapet, instead of being built on the highest point of ground, is placed at the bottom of a hill in a back slum, next a dead wall; the broaches being invisible the spire has the appearance of having slipped down into the tower.

S. Stephen's has the sills of two windows, formed partially horizontal and part oblique; in fact, a large corner cut off to admit of a doorway underneath. The tower certainly is peculiar, as the buttresses on one of its sides are corbelled out from the bell chamber level; this, of course, is not "ordinary," as the usual way of construction is for the buttresses to support the tower instead of *vice versa.*

"Plymouthian" speaks of the church in Plymouth which Mr. St. Aubyn is building as promising "to be the most striking modern work in the diocese." Your correspondent can scarcely ever have been out of Plymouth, or he would not make such a remark. We will only mention one (doubtless there are many) immeasurably before Mr. St. Aubyn's—viz., S. John's, Torquay, by Mr. Street.

From our point of view the churches of Devonport do not show a power of good design in their architects, nor in the happily blending of other peoples' ideas. A poor copy is worse than a defective design; in the latter there must be originality, in the former none. It is merely working upon other peoples' brains, a practice, we fear, too common with many architects.—We are, &c.,

Plymouth. Quatrefoil.

CHURCH RESTORATION IN SOMERSETSHIRE.

Sir,—Whilst rambling amongst the Somersetshire churches a few days since, I entered the fine Perpendicular church of Long Sutton; many of your readers no doubt know it, with its fine oak rood screen and pulpit, on both of which the original colouring and gilding were, until lately, in fair condition. Imagine my disappointment at finding that they have been repainted and gilded, no doubt with the intention of faithfully restoring the original colours; a small part of one of the side screens is, however, fortunately left pretty much in its original condition, and will show with what insufficient authority the crude violently-contrasting blues and reds have been laid on; the effect is coarse, raw, and displeasing in the extreme.

From the walls the whole of the plastering has been removed, without, so far as I could learn, any attempt having been made to preserve or keep a record of the wall paintings, found in abundance under the layers of whitewash. The Ham-hill stone piers and arches and other freestone dressings have been scraped as Somersetshire church restorers only can, or do, scrape; the general walling of the blue lias of the district has been entirely retooled, the contrast in colour being again very harsh.

The chancel roof has been grained "dark oak." Calico texts have, of course, not been forgotten. The whole of the interior appears quite new, and the general effect is tawdry.

The exterior has, fortunately, escaped. having only had a few judicious repairs. It is evident that no architect of the humblest pretensions can have been consulted in the matter.

This work is a fair specimen of church restoration in this part of Somerset. There appears to be an eager desire to remove every particle of plastering, and as great a desire to get rid of everything (in the interior at least) that can be even suggestive of age or mellowness of tone in colour.

At Wells the west front of the Cathedral is covered with scaffolding, and all defective parts of the masonry are being reinstated; this is no doubt necessary to the stability of the structure, though disappointing to the archæologist; yet I would ask if a capital or other carved detail has lost a fragment, is it desirable that a piece of stone should be neatly inserted and carved in continuation of the old? Because, if this sort of work goes on there really will be no particle of antiquarian interest attaching to our old Mediæval buildings after a few more years; all will appear equally new, and the modern work will be inextricably confused with the ancient.

The church at Cheddar is in course of restoration by Mr. Butterfield. The walls I found cleared of plaster, with the exception of some parts in the tower; on these remain fragments of wall painting of interesting and excellent character. I was informed that the pick of the workman was arrested whilst in the act of hacking them down by the accidental interposition of the architect. I was also told that wall painting had been found throughout the greater part of the church; slight evidences of this still remain on the parts of the freestone not yet cleaned. I think it most unfortunate that greater care was not taken to search for and carefully expose all the painted decorations, that tracings or drawings might have been made, if it was found impossible to allow them to remain.

It is surprising how very little record has been kept of the vast extent of Mediæval mural decorations that have been sacrificed to the rage for evenness of surface and smart newness of appearance.—I am, &c., J. A. C.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINS.

Sir,—"Plumber" clearly does not understand the object of my "trough junction." For his, and your readers', information I may say the principle on which it is constructed may be simply stated as the interception and escape of the sewer-gas by means of a trough open to the external air at every connection. "Plumber" says I do "not catch the idea of Professor Reynolds' plan, which is not for dealing with the gas generated in drains, but with the gas coming back from common sewer, and preventing it getting into house drain." This is perfectly true, and I quite understand it, but "Plumber" forgets the objection he made to this, as far as it goes, very simple and economical plan. He spoke of gas being "generated in soil and waste pipes" *within* the house. Now, it is this objection which my plan removes. The plan I propose allows the escape of this rising gas, externally and innocuously at the upper end of soil or waste pipe, just before entering the closet-syphon or trap. In fact, it renders the syphon or other trap comparatively of little value except as a useful secondary check. Instead of its free escape, the gas may be deodorised and disinfected by passing through charcoal, an alternative really not required in ordinary cases. The objection may be raised that such escapes would be noxious; my reply is, that, as the escape would be *constant* and not intermittent (as when an air-tight soil or waste pipe charged with gas is relieved by the opening valve or down rush of matter), the gas could not generate fast enough to become either deleterious or to accumulate in any appreciable quantity—in fact, it would be infinitesimal. Under this system the closet pipes are supposed to be placed, as they ought to be, close to an external wall.

This "trough junction" may be variously applied —it may simply be fixed between the closet-syphon and soil pipe, or it may combine the trap and trough in one simple form, as I have detailed elsewhere, and it may further be provided at the air grating with charcoal for disinfection. It can be fixed within the thickness of the wall, and can easily be cleaned or adjusted.

The point of difference between Professor Reynolds' and my plan is that his intercepts the sewer gas before entering the house, while mine does so at any or at every interval required.—I am, &c.,

G. Huskisson Guillaume.

SCHOOL PLANNING COMPETITION.

Sir,—It appears to me that the site which you have imagined for the purposes of this competition is altogether too small and confined for the proper and healthy accommodation of 700 children upon it. It was once (I use the past tense because it seems there is not much permanence or finality at the Education Department)—it was once a rule that no grant should be made towards the erection of any school where the site did not exceed 40 lace of ground. The site which you have sketched contains about 44 lace; but three or four lace should be deducted for "care-taker's residence," with yards and conveniences, so that the remaining ground is too near the bare limits which the Education Department will allow. Besides, is it wise, in a case of this kind, to countenance and foster such a policy? Supposing that the buildings are one story in height only—as they should be—then by the conditions which you name, more than three-fourths of the whole site must be built upon. Under these conditions is it possible to design a model school complete and perfect in its manifold phases? I am afraid not, and unless the site is enlarged the advantages of this competition will be lost, and the labour of competitors will be spent in vain.—I am, &c., H.

Sir,—In addition to last week's queries (partially forestalling mine), will you kindly embrace the following in your forthcoming comprehensive reply. 1. Where are the "rules, &c., issued by the School Board of London" obtainable; and at what cost, if any? 2. What is the length of the back boundary line? 3. The house in cross street is set back from the street line; is that line of frontage to apply to the proposed building; if so, what is the exact distance? Is cross street level? 5. No mention is made of a bell; is one required? 6. Could you oblige by naming the judges now? Courtesy should propose and Experience second the selection of the gentlemen who adjudicated on the last occasion. Failing that, the publication by you of a list of (say) six gentlemen, willing to act as judges, and the selection of two therefrom by the competitors themselves, *should* give universal satisfaction.—I am, &c., F.

Sir,—On reading your instructions for this competition, it appeared to me that, on the subject of playgrounds, they were not quite clear. In specifying an infants playground, do you mean that only this is to be provided, or do you intend that there shall be three separate playgrounds? If the latter, it seems to me that there will not be near enough land (25 superficial feet per child is, I believe, the London School Board minimum).

In what proportion is the 9ft. to be divided between the general school-room and the class-rooms? Should there be a master's or mistress's private room in connection with either of the schools? The desks in the general school-room should seat how many? What number should the drawing school be capable of holding? What rooms should be provided in the caretaker's residence?—I am, &c., M. C. H.

Sir,—In your instructions you request competitors to adhere to the instructions of the Committee of Council on Education as to widths of school-rooms—*i.e.*, from 18ft. to 22ft., thus preventing the fixing of desks and benches on both sides of the room. Now, the Committee of Council on Education have passed schools from my designs, with the rooms 30ft. wide, and desks on each side, but I can find no mention of such rooms in their rules, or in those of the London School Board. Do you allow us to arrange for rooms so wide as to take two sets of desks and forms, or must we only have them on one side?—I am, &c., Competitor.

Sir,—In reference to the graded schools, the number (220) of boys or girls is rather large for one room, and the teachers' strict supervision could scarcely be applied, I think, to the whole of the room at one time. Would it not be better to subdivide them into junior and senior departments? Is the "general-room" to be so planned and "fitted" to accommodate the whol (*i.e.*, 220 boys and girls and 260 infants) number o children at one time without the use of any of the class-rooms, or is it only to accommodate the rest of children supposing class-rooms to be filled? It says playground for "infants," does it mean for infants alone and none for the graded schools? In reference to scale I agree with "T." in suggesting an eighth scale be used. Lastly, as to finishing the drawings, it says they should not be shaded with Indian ink, or be tinted with flat washes, and above all "colours" should be avoided; how ought they be finished? Other competitors as well as myself are in doubt of the previous questions, and would esteem it a favour if made clear at once on these points.—I am, &c., X. Y. Z.

Sir,—When you reply to the other inquiries on the above subject, will you oblige by answering this one? In the School Board rules for planning infants' schools it is laid down that the school-room is to have two galleries of unequal size, one of them capable of accommodating the whole of the children at one time. Besides this there is to be a group of benches and desks. Now, I wish to know whether *the whole* here means the 260 infants attending the schools or merely the 160 that would be in the school-room when the class-rooms have their complement.

I imagine that a gallery to hold 260 would, with the other gallery and a group of desks, occupy nearly the whole of the floor, and leave scarcely any space for the marching and countermarching that form such an important part in the training of very young children. —I am, &c., J. S.

DESIGNS FOR THE EDINBURGH CATHEDRAL.

Sir,—The competitive designs for Edinburgh Cathedral (sent in under motto) having been publicly exhibited, the Scotch newspapers have taken the liberty of assigning the designs to the different architects. This they have utterly failed to do correctly, and I take the liberty of mentioning the fact to you lest you should fall into error by assuming their statements to be authentic.—I am, &c.,

Inverness, Aug. 19. Alexander Ross.

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Intercommunication.

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QUESTIONS.

[2632.]—**Evaporating Gill Stoves.**—What are the special attributes and cost of the above-mentioned stoves?—F.

[2633.]—**Chinese White.**—Having some fluid Chinese white that takes an unconscionable time to dry, I wish to know what can be mixed therewith to accelerate the process.—F.

[2634.]—**Omnifarious.**—Why are so many queries allowed to remain unanswered?—F.

REPLIES.

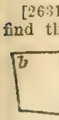
[2620.]—**Slating Towers.**—I cannot agree with the remarks of "An Old Cornish Slater." He says if a work is worth doing let us do it well, or not at all. My impression is that the lead should be put on to arrange with every course of slates—viz., if size of slates are 20in. × 10in., and (say) 3in. bond or lap, the lead should be 11½in. in height by sufficient in breadth to pass over the roll on hip and half way over on the under slate on each side of roll, so that the lead and slates will have the same bond as any other part of roof. This is the best and soundest job that can be made, and will add greatly to the appearance of spire, which can never leak.—Old Chips.

[2627.]—**Template and Templet.**—Template is a short piece of timber or stone, about 24in. × 9in. × 3in., laid under the end of a bressummer or girder, resting on a wall, particularly in brick buildings, to distribute the weight over a large space. Templet is a mould used by masons, machinists, smiths, shipwrights, &c., for shaping anything by. It is made of tin, zinc, sheet iron, or thin board, according to the use to which it is to be applied.—Old Chips.

[2627.]—**Template and Templet.**—The difference is purely orthographical; both words appear to be used indiscriminately to denote a mould, and the bearing piece under a beam or girder.—F.

[2629.]—**Books.** — "Antiquities of Athens," by Stuart & Revett, is to be obtained at Batsford's, 52, High Holborn. I cannot inform your correspondent accurately on the other question, but I believe Nicholson's "Practical Carpentry, Joinery, and Cabinet-Making," to be one of the best. It is also sold by Batsford, price 16s. (cost 38s.).—G. E. S. L.

[2631.]—**Planning.**—"A Young Carpenter" can find the angles of the room in many ways. 1. By measuring the four sides and the two diagonals, and solving for the angles (by far the most accurate). 2. By the ordinary field-level. 3. If the corners be void of furniture, by a sextant standing at *a*, getting the corner *b* in the object-glass and the corner *c* in the mirror.—J. T. J.



Our Office Table.

Historical Portraits.—A notable discovery has just been made by some workmen at Dumfries House, Ayrshire, which was formerly in the possession of the Earls of Kilmarnock. The house now belongs to the Marquis of Bute, and the men, in repairing the roof, found two half-length portraits rolled up and hidden in the rafters. On examination one proved to be the portrait of that Earl of Kilmarnock who was executed for rebellion in 1746. The other had no name with it, but after much difficulty, and by the aid of ingenious reasoning employed by historical and heraldic experts, it was found that the subject of the picture was John Drummond, Earl of Melfort, who was outlawed in 1694, and died at S. Germains in 1714.

Sharp Practices of Contractors. — The *Globe* exposes a piece of sharp practice in connection with "tenders for contracts." In one of the London parishes, recently, it was found necessary to contract for cleansing and watering the district. The number of firms in the metropolis capable of undertaking such a work is necessarily limited, and it is stated that their representatives, in consequence of the advertisement for tenders, met together and decided among themselves which should accept the work best suited to his "plant," the others sending in tenders at such a rate that they must inevitably be refused. It was in effect, if the facts stated are correct, a combination to defeat the object of advertising for tenders altogether, and to control the market. It was further intimated that if the acceptance of a contract was not forthwith decided on, the contractors would withdraw their tenders, and on some excuse or another make a much higher estimate when further called upon. There was consequently, in the face of this proposal, but one course to adopt—to accept the lowest tender, and to submit to the enforced monopoly.

Railway Communication with India.—A paper was read by Mr. Hyde Clarke before the British Association on Friday last on the progress of the through railway to India. It stated that on this side the railway to India has long since reached Bashiash, on the Danube, and halted there; but at length the Turkish Government has taken measures for its extension. The main line will be from Hungary, through Servia, to Filitch (Philipopoli), and Idrench (Adrianople), to Constantinople. On account of political difficulties raised by the Servian Administration, the works have been carried on at other points; but the Servian junction having been arranged, operations will be begun there. The works now in progress are from Thibet to Constantinople; from Uskup to Salonika and the Mediterranean; from Edrurch to Didch Aghey, on the same sea. Several portions were open, or ready for opening. The Constantinople terminus is ready. Only twenty-five miles will at the end of the year remain uncompleted between Constantinople and Edrurch. A connection is proposed between Edrurch and the Varna. The Salonika branch is preferred as a steamboat station for the Euphrates Valley and Alexandria. No measures are taken for passing the Bosphorus at Constantinople except by steamboat.

The Mason College, Birmingham.—Mr. Josiah Mason, "the Birmingham Peabody," and the founder of the Erdington Orphanage, has added another to his many useful and noble gifts. The foundation deed of the Mason Working Men's College, to be erected at Birmingham forthwith, has just been made public. The value of the endowment is stated to be £150,000. Instruction is to be provided by means of classes in mathematics, physics, chemistry, the natural sciences (especially geology and mineralogy, with their application to mines and metallurgy), botany, zoology, physiology, the English, French, and German languages, mechanical drawing and architecture. In addition to these the trustees may arrange for systematic or popular instruction. It is a fundamental condition of the institution that no lectures or teaching or examinations shall be permitted upon theology, or upon any question or subject in its nature purely theological, or upon any question which, for the time being, shall be the subject of party political controversy. No theological test is to be required from any officer or servant of the institution, but all appointments are to be made with sole regard to fitness to discharge the duties required.

Barren Honours.—A correspondent of the *Birmingham Gazette* writes:—"Mr. Gilbert Scott's knighthood is gazetted, I see. Surely it cannot be Mr. Gladstone who advises the Crown as to the conferring of these honours. Considering what the Church of England owes to Mr. Scott—not to say what the nation owes him—and bearing in mind the sort of people who have lately been made knights, the compliment paid to him is equivocal enough. For my own part, I can trace in what has been done only the hand of Mr. Ayrton, whose admiration for architects is so notorious. To suggest it to the Premier would naturally occur to the First Commissioner as a grim joke, and Mr. Gladstone is not specially permeable to humour of any sort."

Concealed Dangers Beneath Streets.—A disclosure just made in respect of one of the most crowded thoroughfares of Liverpool adds a new terror to our journeys through the streets. It appears that the inexplicable flooding of a cellar in the neighbourhood of Scotland-road led to an examination by the borough engineer, who, in the course of his investigation, made the startling discovery that the main road was gradually disappearing, it having already sunk to the depth of three inches. The tramway cars were, nevertheless, running in their customarily comfortable manner, and the traffic generally was proceeding as if Scotland-road still stood where it did. Notice was given to cease working the tramways, and men were promptly sent to open the street, when it was found that, on taking up the setts, the pick went through the shell of the street into a hollow from which vapour of water puffed. A large hole was then broken in, and a cavity was found about 25ft. long, 18ft. wide, and 12ft. deep, full of water. The thickness immediately under the street which covered the opening, and which must have supported the roadway and tramway for a considerable time, was about 12in. at the thinnest part. It consisted of the pitching of the street, which was, fortunately, in remarkably good order, and "had a compactness and rigidity almost equal to that of concrete." In London, Holywell-street, Strand, is reported to be in such a sinking condition as to cause great anxiety to its inhabitants. The street has lately been called upon to bear an unusual strain of traffic, owing to the temporary closing of that part of the Strand which lies between S. Clement's Church and Somerset House, and shows an inclination to subsidence. To add to its peril, under each tenement is "a large ancient cesspool."

A New Rock Drill.—Many descriptions of rock drilling machines have been designed within the past ten years or so with more or less satisfactory results; and although perfection in this kind of boring apparatus is possibly not yet attained, a good step in this direction has been taken by Mr. McKean, who for the last six years has been experimenting, and has at length constructed a machine which, for simplicity, facility of manipulation and application in any position, combined with strength, is believed to be unrivalled. It is driven by either steam or compressed air, and can be adapted for open cutting or tunnelling. A machine weighing 150lb., driven by 75lb. steam, drills a 2¼in. hole to a depth of 12in. per minute in Aberdeen granite. This is a maximum, but an average duty of from 6in, to 9in. may be relied on. It makes from 500 to 1,000 strokes a minute, free from shock to the machine, as the piston cushions against steam or air, and the feed is either automatic or by hand as desired. One of these drills can be seen working daily in granite at 42, Borough-road.

Birkbeck Benefit Building Society.—This society attained its majority with the publication of the twenty-first annual report in April last, and the directors express satisfaction at the steady progress and continued prosperity of the society. The total receipts of the year show an increase of nearly one million sterling over those of 1870-71. To give the exact figures: the total receipts are £2,698,206 11s. 9d., showing an increase of £958,020 2s., or within £41,980 of one million; in other words, the increase alone is within a few thousands of the total receipts during the first fourteen years. To show the progress of the society in a still more striking manner, the receipts for 1871-72 are more than half a million in excess of the receipts during the first sixteen years. The number of shareholders who have been enrolled during the year is 930, of whom 796 are investing members, and 134 borrowing members; while in the deposit branch 8,813 accounts have been opened; making a total of 9,743 new accounts within the past twelvemonth. After deducting those who have withdrawn or are deceased, the society numbers 21,441 names on its books. The shares taken out in the same period are as follows—viz., 4,603 by investing members, and 1,423 by borrowing members, making a total of 6,026 new shares which have been registered during the past year. The total number in existence is 24,733. The society possesses surplus funds to the extent of nearly half a million sterling—viz., £461,318 11s. 4d. Of this large sum £289,270 13s. 9d. have been advantageously invested in Government stock and other readily-convertible securities, while £160,000 have been lodged at interest on deposit receipt with the Union Bank of London. The whole of these surplus funds thus temporarily invested can be made available, as required, for the legitimate business of the society, at a few days' notice.

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WATER SUPPLY AND SANITARY MATTERS.

Birmingham and its Sewage.—An influential deputation from the Birmingham Town Council visited Nuneaton last week for the purpose of inspecting Dr. Anderson's system of defecation of sewage with sulphate of alumina and lime. The process was explained by the doctor, and several samples of sewage from Birmingham were treated with the admixture, a general opinion being expressed that the water would be perfectly clear after flowing over land. At a meeting afterwards a strong opinion was expressed on the present unsatisfactory state of the law, the Court of Chancery granting injunctions against towns, and Parliament refusing the necessary powers.

Brentwood.—In consequence of certain complaints sent to the Local Government Office relative to the alleged inefficient manner in which the new drains have been constructed, on Thursday, the 15th inst., Mr. Arnold Taylor, one of the Government Inspectors, went to Brentwood to meet the Sanitary Committee, recently elected at a public meeting with a view of investigating the works. After a careful inspection of the works, the party proceeded to inspect the outfall. A report will follow in due course, but from remarks made by the inspector *en route* he appeared to consider the works were properly constructed, only requiring the assistance of flushing to secure a regular passage and outfall of the drainage. Before separating, a scene of a somewhat recriminatory nature ensued between Mr. A. Thorne (the parochial surveyor) and Mr. W. Russ (the engineer for the new works), the former accusing Mr. Russ of having broken into the old drains in constructing the main sewer, and thus diverting the flow and creating additional nuisances. Mr. Russ replied that he had received no complaint of the kind while the works were constructing. Mr. Thorne said he had complained to him. The inspector asked if the complaint was in writing, to which Mr. Thorne replied in the negative, when the inspector said he could not take cognisance of a verbal complaint. He said that, as the works stood, they were a costly monument of folly, as not more than one-fifth of the houses were connected, and until that was done, and the sewers and drains properly flushed, no system could work efficiently.

Buxton.—The arbitration for the sale of the Buxton waterworks from the Duke of Devonshire to the Buxton Local Board has come to an end, and the amount of the award is £8,840. Mr. Cawley, M.P., was the arbitrator employed by the Local Board, and it is hoped that he will soon have a scheme ready which will secure to Buxton a large, good, and permanent supply of pure water.

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STATUES, MEMORIALS, &c.

The Late Sir Roderick Murchison.—A tablet with medallion of the late Sir Roderick Murchison, has been placed in Bathampton Church. It is of pure Carrara marble on black marble, and was executed by H. Weekes, R.A., of London.

Statue of Leonardo da Vinci.—A colossal statue of Leonardo da Vinci, by the well-known sculptor Magni, has just been placed in the Piazza della Scala at Milan.

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CHIPS.

A new railway station is being erected at Barmouth, from plans by Mr. George Owen, C.E.

It is stated that a new Bangor slate company, with a capital of £35,000 in £5 shares, has been registered.

A chancel is to be added to the Church of All Saint's, Babbicome.

On Wednesday week the foundation stone was laid at Kingston-on-Thames of new schools, which will accommodate 526 children. The building is designed by Mr. Charles L. Luck, of Carlton Chambers, Regent-street. The builders are Messrs. Todd & Sanders, of Kingston-hill, who contract to erect the schools at a cost of £2,500.

The new schools of S. Frideswide, Osney, near Oxford, were opened on Thursday week. Mr. Bruton was the architect, and Messrs. Honour & Castle the builders.

A new oak pulpit, designed by Jones & Sons, of Liverpool, has been erected by that firm in the Church of All Saints parish in that town.

On Monday week the memorial stone of a new Sunday school, which is being erected at the rear of the Wesleyan Chapel, Smallthorn, was laid. Messrs. Moss & Son, of Ford Green, are the builders, and the original contract for the building was £250.

The Bristol Corn Exchange, which has just been roofed in with glass and altered, from designs by Mr. E. M. Barry, was reopened for the transaction of business on Wednesday week. The total cost of the alterations has been about £7,000.

The sum of £745 has already been received in aid of the proposed Sailors' Home in Dundee.

A new organ of twenty-one stops, built by Messrs. Forster & Andrews, of Hull, has been fitted up in the Church of S. Marnock, Kilmarnock, at a cost of £350.

The cost of labour has risen so much lately in Liverpool that, according to the *Northern Echo*, the new baths which were to be constructed a few months ago for £10,000 will now cost £16,000.

S. John's Schools, Wolverhampton, are now being enlarged by the addition of a room to accommodate about 170 infants, with class-room attached. The building is one story high, of a plain description. Mr. J. R. Veall is the architect.

A new theatre is in course of erection at Strasburg.

If the Hôtel-de-Ville of Paris does not rise speedily from its ruins, remarks *Galignani*, it will not be from a dearth of architects, as the number of those who have already inscribed their names to take part in the competition for the reconstruction of the building is 422.

After a long discussion, the Bristol City Council have resolved, by 32 to 17, to appoint a city surveyor and architect, but not to require him to give his whole services to the city; and the committee are to ascertain what terms can be made with Mr. Josiah Thomas.

A minute has been issued from the Board of Trade embodying a number of regulations relating to the water supply of the metropolis, under the Act passed in the session of 1871. These point to a more efficient system of communication pipes, and amongst other provisions it is laid down that no pipe in connection with the Company's water shall in any way communicate with any cistern intended for the reception of rainwater.

For some time past workmen have been engaged in preparing the site for the new parish church which is about to be built at Jedburgh, and it is expected that the masons will commence the work next week, should the weather be favourable.

Mr. Noble, R.A., has just completed his colossal model of the statue of the late Earl of Derby, to be erected in the Park at Preston, Lancashire.

The foundation stone of a little chapel of ease, dedicated to S. Mary, was laid at Ewshott, Surrey, on the 14th inst. The building, designed by Mr. J. O. Scott, architect, will cost about £1,800.

On Monday at noon a section of the system of tramways in Glasgow was formally opened.

The journeymen and apprentice house-painters in Glasgow held their annual regatta on the Clyde, at Glasgow Green, on Saturday last. The boats pulled were named "Edwin Landseer," "David Roberts," and "Noel Paton."

The foundation stone of a new parish church was laid yesterday (Thursday) at Parwich, Derbyshire.

A new explosive has been brought out under the name of fulminatine, which is said to consist of a mixture of nitro-glycerine and siliceous matter, with 15 per cent. of a substance the composition of which is a secret, but which is dissipated as gas on ignition.

The ironfounders of Sheffield have notified an advance in prices of 30 per cent, which entirely stops all speculative building.

The most remarkable engineering feat now in progress (says the *Philadelphia Ledger*) is to be the crossing of the Andes by the Lima and Oroya Railroad. The mountain chain will be crossed at an altitude of 15,000ft. by a tunnel 3,000ft. in length. The grades are the steepest known on any ordinary railway. The workmen employed are Cholos Indians, the only operatives who can endure for a prolonged period the rarefied atmosphere at this great elevation.

The Cambrian Archæological Association will hold its 27th annual meeting at Brecon on Monday next until the following Saturday. The president is Sir Joseph Russell Bailey, M.P.

In pasting cloth to maps get some very common calico, cut it roughly to size, lay it on a smooth, clean board—a table leaf is first rate—sponge it with water till it lies quite smooth on the board. Paste the map, and lay it on the calico, then rub with a clean handkerchief till all the air-bubbles and wrinkles are gone. Leave it on the board till quite dry, when it will almost fall off and be perfectly smooth.

Trade News.

WAGES MOVEMENT.

AGITATION AMONGST THE DUSTMEN.—On Friday last a monster meeting of the scavengers, slopmen, and dustmen of the metropolis was held in a hall in Bell-street, Edgware-road, for the purpose of forming a trade society for their protection. The following resolution was adopted:—"That, in the opinion of this meeting, the time has arrived for agitating for an increase of wages upon the present standard, and a reduction of the present working hours."

BRIGHTON.—The carpenters and joiners of Brighton are taking steps to secure shorter hours of labour and higher wages. Delegates from London have waited upon the men, and a resolution has been passed to the effect that delegates from each shop in the town should meet and draw up a memorial on the points in question to present to the masters, the proposed new arrangements to come into operation next Spring.

GREENOCK.—The employers in the building trade of Greenock have agreed to grant the request of the masons and labourers—viz., an additional ½d. per hour to the former and ¼d. per hour to the latter.

LONDON.—Once again we are led to entertain hopes of a speedy settlement of the dispute in the London building trades. On Thursday week, at the meeting of the carpenters and joiners, the following resolution was moved:—"That in consideration of the declared willingness of the carpenters and joiners of London to negotiate with the employers to effect a settlement of the existing dispute, we deem it our imperative duty that we at once adopt measures for carrying out that object, and that the committee be invested with full powers to settle all points in dispute." An amendment was proposed to the effect that the resolution proposed by the committee should be withdrawn; but, after a long discussion, the original motion was carried by 44 to 19. A resolution was then adopted requesting the men to abstain from resuming work in any of the closed firms, pending the result of the negotiations. In answer to a letter addressed to him, inquiring whether the statement published that the committee of the Master Builders' Association are willing to meet a deputation of carpenters and joiners is founded on fact, Mr. Stanley Bird, the honorary secretary, wrote that the committee adjourned on the 1st instant for a month, that no meeting had since been held, and that any communication he might receive in reference to an interview would be laid before the committee at their next meeting. On Monday night the secretary of the Carpenters' and Joiners' Central Committee received a letter from the assistant-secretary of the Masters' Association, stating that a special meeting of the General Committee of the Association would be held on the following Thursday, when the resolution of the delegates of the men would be submitted for consideration. It was understood that at this meeting the masters would appoint a sub-committee to meet the men's deputation, and arrange the terms of settlement. A special meeting of the Central Committee of Carpenters and Joiners was held on Tuesday. The letter received on the previous evening from the secretary of the Masters' Association was read. The committee then decided that the proposed deputation should consist of not less than five persons, the responsibility being too great to be entrusted to a less number. The general feeling of the committee was that, although the deputation would attend with full powers, there must be a clear understanding that they would be at liberty to retire at any time during the negotiations, if they felt the terms put forth and insisted upon by the masters would be prejudicial to the interests they represented. It was also understood that the deputation would open negotiations upon the basis of a reduction of the working hours from 54½ to 51 per week, an advance of wages to at least ½d. per hour, and the adoption of a code of working rules.

THE POTTERIES.—The china and earthenware manufacturers in the Staffordshire Potteries have added 10 per cent. to prices, and the workpeople have given notice of a demand for a large increase of wages in November.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled, Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show rooms: 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

BROADSTAIRS.—For the erection of house and coal-store, Broadstairs Gasworks:—

Harrison	£740	0	0
Elgar	739	0	0
Howlet	575	0	0
Horne	575	0	0
Hayward	560	0	0
Stark (accepted)	554	15	0
Hillier	525	7	6

CARSHALTON.—For the erection of a detached villa at Denmark-road, for William McMaster, Esq. Mr. Horace A. Alexander, architect:—

Rabbits (accepted)	£950

HAMPSTEAD.—For studio at "The Priors," Hampstead, for W. S. Cookson, Esq. Mr. Horace Field, architect:—

Nightingale	£965

HIGHBURY.—For proposed works at S. Augustine's Church, Highbury. Messrs. E. Habershon & Brock, architects:—

Carter & Son	£736	0	0
Nightingale	712	0	0
Kindell	671	7	0
Haynes	664	15	0

KENT.—For the erection of a cottage hospital at Sevenoaks, Kent. Mr. John M. Hooker, architect:—

Anscomb	£925
Wiltshire	894
Wheatley	838
Nutter & Warren	822

KENT.—For sewers for the Sevenoaks Local Board of Health, Kent. Mr. John M. Hooker, architect and surveyor:—

Willis	£263
Wiltshire	245

KENT.—For erecting house and offices at Sevenoaks, Kent. Mr. John M. Hooker, architect. Quantities supplied:—

Anscomb	£2723

LINCOLNSHIRE.—For the erection of a house and offices at Manton, Kirton-in-Lindsay, Lincolnshire, for M. W. Dalison, Esq. Mr. J. M. Hooker, architect. Quantities supplied:—

Holt Brothers	£2899
Booth, Illingworth, & Son	2720
Halliday & Cave	2545
Hobson & Taylor	2275
Huddlestone & Son	2025

LONDON.—For proposed works at 291, Euston-road, and 135, Tottenham-court-road, London. Mr. Lovegrove, architect:—

	Estimate 1.	Estimate 2.
	£	£
Bishop & Hooper	1413	649
Brighton	1289	530
Stimpson & Co.	1245	575
Nightingale	1148	539
Patman & Fotheringham	1130	545
Hibbins & Trasler	1120	499
Scrivener & White	1080	503

PECKHAM-RYE.—For the erection of a villa at Peckham-rye, for Mr. Wilson. Messrs. Tolley & Dale, architects:—

Pollard	£1530
Sabey & Son	1514
Blake & Co.	1473
Nutt & Co.	1458
Knight	1375
Thomas	1300
Nightingale	1298
Hiscock	1280

SALFORD.—For alterations and additions to Christ Church Rectory, Salford. Mr. John Lowe, architect, Manchester:—

Neill & Sons	£1016
Clay & Sons	991
Southern	980
Terras	930
Davies & Mawdsley (too late)	887
Wood	817
Wilson	806
Napier (accepted)	772

SURBITON.—For the erection of a stable. Mr. N. S. Josephs, architect:—

Newman & Mann	£513
Perry Brothers	497
Vaughan	415
Munday	395

SURREY.—For the erection of a house and stables at Kingston-hill, Surrey. Messrs. F. & H. Francis, architects:—

Myers	£5419
Dove	5375
Colls & Son	5170
Fish	5150
Gibson	4793
Hurst	4750

SUTTON.—For the erection of detached villa at Stanley-road, Sutton, for W. A. A. Reeve, Esq. Mr. Horace A. Alexander, architect:—

Eaton & Chapman	£1379
Potter & Ferrige	1245
Garrud	1183

SYDENHAM.—For the completion of two houses at Silverdale, Sydenham:—

Parkes	£1024	0	0
Winter	955	0	0
Creba	925	10	0
Huff	925	0	0
Bysh	925	0	0
Beach	890	0	0

WANDSWORTH.—For the erection of entrance-lodge at Wandsworth, for the Royal Commissioners of the Patriotic Fund. Mr. H. Saxon Snell, F.R.I.B.A., architect:—

Chappell (accepted)	£423

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COMPETITIONS OPEN.

CITY OF LONDON, September 5.—For designs and tenders for the execution of a medal, to be struck as a memorial of the late National Demonstration on the visit of Her Majesty to the City on the Thanksgiving Day.—Woodthorpe, Guildhall.

GRAYS THURROCK (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

KINGSWINFORD SCHOOL BOARD, September 3.—For a design for school buildings to accommodate 800 children, with class-rooms, master's and mistress's houses. Premiums of £10 for the best and £5 for the second best designs.—Mr. J. L. Holberton, Clerk to the Board, High-street, Brierley Hill.

OBAN, September 12.—For designs for a new church. A premium of £25 will be given for the most suitable design.—Mr. James Nichol, Banker, Oban.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 30, 1872.

TERMINATION OF THE BUILDING TRADES' STRIKE.

THE combined strike and lock-out which has thrown the metropolitan building trades into confusion for the last twelve weeks has terminated unsatisfactorily. Influenced by the general rise of prices and the increased demand for labour in the country, the London carpenters, joiners, and masons, demanded more wages and shorter hours; and, as a matter of course, these demands were stoutly, and not in the politest way, resisted by the masters. Hence the strike and lock-out which, at one time, threatened to be one of the most robustly-contested struggles on record. The men demanded ninepence an hour, and nine hours' work per day. At first all the building trades joined in the demand, and at one time there were between 10,000 and 12,000 men on strike in London. The masons, however, were the first to give way. They made, on their own account, without consultation or understanding with the amalgamated trades, arrangements with their employers, on a modified basis of action. From that moment the strike phalanx was broken, and the prospects of a successful issue on the part of the men narrowed. The masons were accused of half-heartedness, and even treachery. They defended themselves by saying that they did not originate the strike, that they were not so well organised as the other trades, that their exchequer was not so full, that they had not a fair share of the subscriptions that came from the country, and the conditions of their trade were different from those of the carpenters and joiners. No one can blame the masons for resolving to accept at their own time the best terms they could make, and if they were blameworthy it was for the clandestine method in which they conducted and concluded the negotiations. No one can say that the other trades have acted unmagnanimously, and it is a pity that any damaging charge can be brought against any one of its sections.

When the strike commenced we ventured to suggest what we considered at the time a reasonable compromise. Seeing that the men were bent on shorter hours we advised the employers to accept the nine hours' arrangement, as we felt certain, and we still feel as certain, that no other settlement can last long. The men attach more importance to the question of time than they do to the scale of payment, and there was something like a passionate longing for the nine hours. Had the employers at the outset shown a disposition to yield on this point there would have been little or no difficulty to settle the amount per hour to be paid. The employers were firm, and the men were equally so, and as a result the summer has been wasted. But that is not the worst part of the matter. The battle, at best, can only be said to be a drawn one. The men have accepted a settlement under a protest. They say distinctly that they will begin the struggle again on the first favourable opportunity. As it is, they will begin work with a scowl on their faces and with no cheerfulness in their hearts. Instead of 51 hours a week, the working hours in the shops will be 52¼ hours a week all the year round, or about 9¼ hours per day; and 52½ hours for 40 weeks in the summer, and 48 hours per week for out-door work in winter. The wages will be 8½d. per hour all the year round. We believe it would have been a much wiser thing to have made it 52 hours per week. Then the men would have obtained what they most desired, and they would have recommenced work with more *verve* and spring, and in all probability the employers would be the actual gainers. The settlement lacks genuineness and strength. There is no shaking hands or drinking health, or expression of good wishes, but a determination on both sides to reserve strength for future contingencies. It may be asked why should the workmen attach so much value to fifteen minutes a day? and with equal propriety it may be asked why should the employers attach so much value to the said fifteen minutes as to exact them? If it were merely to show their strength it was not good policy, as they have obtained a partial and temporary victory at the price of future confidence and repose. The men, if they like, can perform more work in nine hours than they can in nine hours and a quarter; and as they have imported a sentiment into the nine hours' movement, it would have been good policy, to say the least of it, for the masters to have ungrudgingly acceded the whole hour when they had abandoned three-quarters of it, and particularly as the payment per hour was to be 8½d. instead of 9d. Had the reconciliation been established on this basis, a peace might have been concluded instead of merely an armistice effected.

In glancing over the struggle neither side can pride itself in the temper or the judgment it has displayed. The employers, by refusing negotiation in the first place, developed the seeds of the strike into active life; the workmen, by shrinking from arbitration, widened and embittered the contest. The employers were wrong in selecting aristocratic arbitrators; the workmen were equally wrong in repudiating arbitration altogether—though arbitration by outside arbitrators, who know nothing of the internal policy of the trade, is not so likely to effect a satisfactory understanding as negotiation by interested and well-informed referees. If the employers were unwise in their somewhat imperious conduct, the men were equally unwise in their "no surrender" policy. Their ranks were not so disciplined after all. The masons were not the only ones who exhibited infirmity of resolution. Carpenters and joiners, bricklayers and plasterers, in many parts of the metropolis, have worked all through the struggle for eightpence, and in some instances for less per hour. The employers knew this, and they reasonably calculated that time was on their side, and that if they waited long enough the men would give way. In fact, the Unions found the ground gradually crumbling under their feet by the defection of the men. This daily reduction of strength rendered it necessary on the part of the officials to try to effect a compromise. This lesson must not, or ought not, to be forgotten in future. The men when united have not the best chance of winning, and disunited they court defeat. We trust, however, that some wiser method than strikes or lock-outs will be selected for settling trade disputes. They are unnecessary, wasteful, exasperating, and primarily ineffectual. They cannot do anything which cannot be better done by mutually-appointed negotiators. There is no doubt a growing disposition to strike against strikes, as was evidenced by the resolution in favour of arbitration, submitted by Mr. Hannen, seconded by Mr. Matkin, and carried at the meeting on Tuesday. A knowledge of the disease is half the cure, and this resolution, so spontaneously moved and unanimously carried, is an augury of wiser future action.

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CATCH-WATER RESERVOIRS.*

WE give a short abstract of the principle embodied in this recently-published work for the benefit of those interested in the subject. The author observes that the nature of the watershed or gathering ground from which the water is to be obtained must principally occupy the attention of the engineer in designing a catchment reservoir intended to supply water either to a town or for manufacturing purposes only. It should be at a sufficient altitude above the place to be supplied, and also above the highest point on the route, so as to avoid deep cutting and tunnelling as much as possible. On the other hand, the difference of level must not be so great as to cause the conduit, if open, to be laid with such steep gradients that the velocity of the current may endanger the stability of the channel; or, if composed of pipes, to oblige their construction to be of extraordinary thickness. On the next point — the amount of rainfall—engineers of the present day are now, thanks to the number of rain gauges established in different parts of the country, enabled to obtain more reliable data on which to base their calculations than their predecessors. Still, the rainfall of a given district, especially a hilly one, is very variable, and it is therefore advisable to place as many gauges as possible on the watershed itself, and carefully to observe them for a lengthened period. The gauges generally used are of two kinds, "rain" and "stream." The former should always be so placed as to receive only a fair proportion of the rainfall; if possible, always in the open, avoiding gorges or escarpments. The altitude of the gauges should be accurately ascertained, so as to compare it with the nearest reliable standard gauge; a proper allowance being made for their respective levels, three per cent. of additional rainfall may be expected for every additional 100ft. of level. Stream gauges, if properly constructed and observed, show the actual amount of water which flows off the watershed at a certain point, and the difference between the quantity falling on the whole watershed and the volume passing through the stream gauges will give the amount to be allowed for evaporation and absorption.

Careful examination should be made of the watershed to ascertain whether the water is led from its natural course by artificial drainage, and the geological strata and inclination of the ground should be considered. A rocky and precipitous formation is the most favourable from which to collect water. Purity is also an essential requirement; this is ensured by the absence of peaty or boggy ground, highly cultivated land, or obnoxious manufactories. Limestone is a bad formation, impregnating the water with lime, and containing, moreover, fissures, technically known as "swallows," through which large bodies of water disappear into unknown regions. The soft sandstones, especially the "new red," are absorbent and therefore objectionable.

The calculation as to the amount of water which can be impounded and utilised is one of the most difficult to be made by the engineer, and no basis as yet exists on which it may be founded. It would be very advisable to institute inquiries that might establish reliable data on this subject similar to the experiments made on iron by Fairbairn and others. In the first instance, the average rainfall must be ascertained and provision made against the exceptional circumstances attending a succession of wet or dry seasons. The practice among some of the leading engineers is to deduct one-sixth from the average rainfall to allow for floods which cannot be stored. The amount lost by absorption and evaporation, varying in England from 9in. to 19in. per annum, has next to be determined. It next becomes necessary to apportion the amount of the available rainfall due to the riparian owners, whose claims, especially in closely populated manufacturing districts, are often of a very serious character. By the standing orders of the House of Commons, notice of the intention to apply for power to abstract the water from any stream must be served upon every owner or lessee of a mill or manufactory situated upon that stream within 20 miles below the point at which the water is to be abstracted, unless the stream shall unite with a navigable river in less than 20 miles, in which case the notice need only be served as far as the junction of the two streams. No stream having a natural course can be abstracted without compensating the landowners on the stream *and* obtaining an Act of Parliament. In manufacturing districts it has become a common rule to allow one-third of the available rainfall to the riparian owners, leaving two-thirds for the impounders; this in some instances varies to the proportion of one quarter to the former, and three quarters to the latter. The dimensions and capacity of the reservoir are the next important considerations. These must be calculated to impound enough water to ensure a constant fixed supply during the longest period of drought. The daily average allowance for a town varies from 20 to 50 gallons per head of the population. Twenty gallons per head per diem may be considered a fair allowance for ordinary country towns and rural districts, and 40 gallons for large manufacturing towns. Both quantities include water for sewerage, watering, and other public purposes. The reservoir should contain from 150 to 200 days' supply, as, though droughts of such duration are unknown in England, yet a drought may commence when the reservoir is but half full, owing to a previous limited rainfall. Natural lakes may in some cases be used as reservoirs; it is then necessary to obtain power to raise and lower the natural water level of the lake to such an extent as will give sufficient storage accommodation between these two levels to contain the requisite supply of water for the period of longest drought. The most advantageous site for a reservoir is one where a comparatively small embankment thrown across a valley will form a capacious reservoir of which only one side will be artificial, the rising ground retaining the water on the remaining sides; such favourable circumstances are, however, not often met with. Sometimes, before raising the bank, it is desirable to cut a new course for the stream it is proposed to impound; and in the case of large undertakings, it is advisable to make this division of the watercourse of a permanent character, and thus afford the opportunity of passing heavy floods into the original stream, without allowing them to enter the reservoir should it be already full, or the water too turbid for use. The diverted stream course is also very useful in regulating the speed at which the reservoir is filled on completion, and this very important point is too often overlooked. The actual site of the embankment cannot be too carefully examined. Trial shafts or borings should be sunk both on the centre line and on each side of it clear of the foot of the slopes, so as accurately to ascertain the nature of the ground. First, it should be discovered whether there is any bog or other soft compressible material unable to bear the weight of the intended bank, and requiring to be removed, and next an unbroken strata of water-tight material must extend from one side of the valley to the other, and rise above top-water level on both sides.

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* On the Construction of Catch-Water Reservoirs in Mountain Districts. By Chas. H. BELOE. London: E. and F. N. Spon.

Until some more economical and expeditious mode of rendering a reservoir watertight is discovered, the practice of sinking a trench down to the rock or other watertight material, and filling it with puddle, will probably continue to be adopted, except in the case of small reservoirs, which in most instances can be more cheaply constructed by covering the bottom with puddle and connecting it under the embankment with the wall. The thickness of the puddle wall must depend on the height of the embankment above the surface; the dimensions vary from 3ft. to 10ft. The wall usually batters on each side, a batter of 1 in 8 or 1 in 12 being most commonly adopted. Mr. Rawlinson thinks that a puddle wall should be 1ft. thick at the surface of the ground for every 3ft. in height of the embankment. A bank 100ft. high would thus require a puddle wall 33⅓ft. thick at its base, 4ft. thick at the top, and having a batter on each side of 1¾in. per foot. Much, however, will depend on the nature of the material employed. Some engineers diminish the puddle trench in width in the same proportion to its depth below the surface as the wall diminishes in height when it rises above the ground. The reason for this is not very obvious, as in most cases the ground through which the trench is sunk is so porous as to become saturated with water when the reservoir is full, and consequently the increased pressure falls on the weakest part of the wall; the puddle, therefore, should continue to increase in thickness below ground in the same ratio as it is designed to do above the surface. This, however, for many reasons would be a very expensive operation, and, all things considered, the plan of sinking the trench with perpendicular sides is, perhaps, the best that can be adopted. When solid rock is found at the bottom it is frequently cut into steps or grooves running parallel with the centre line of the embankment, and tending to hinder the water from creeping between the rock and the puddle. Formerly, it was the practice to make the bottom of the trench level, but now it is generally made to incline from each side to the deepest point. All water fissures in the rock should be carefully plugged with wooden or iron plugs, or, if small, caulked with oakum, and in very wet rock trenches Portland cement is advantageously substituted for puddle to fill up the bottom portion. The puddle for filling the trench should be composed of the stoutest and toughest clay to be procured, and should be placed in regular and level layers, not exceeding 9in. in thickness. In very wet trenches gravel puddle may be well used; it should be of the same description of clay—thoroughly mixed before being placed *in situ*, with not less than half its own bulk, nor more than as much as its own bulk of round gravel or broken stone, no gravel or stone being used therein which shall not have passed through a screen of 1½in. mesh, nor which should be capable of passing through a screen of less than ½in. mesh.

The slope of the embankment should be as flat as possible, as the force of the waves is thus materially reduced, and the wear and tear on the bank diminished. All clay not required for the puddle, and other homogenous material not required, should be deposited in the water slope, leaving the stones, gravel, and other porous substances for the back bank or on the down-stream side of the puddle wall, reserving a certain thickness of sound material to place immediately at the back of the puddle, in order to support it as much as possible. It is generally specified that a wall of carefully selected materials should be placed on either side of the puddle wall equal in thickness to that of the wall itself. The water slope of the embankment is usually protected by a thick layer of shingling or broken stones placed roughly on it to within 10ft. or 20ft. of top water level, and from thence covered with pitching or large stones placed edgeways on the bank upon a layer of broken stone. The down-stream slope is generally soiled and sown with hay seed, and a road or footwalk is generally made on the top of the embankment.

In the method of providing an outlet a complete revolution has taken place since the failure of the Dale Dyke reservoir at Sheffield in 1864. Previous to that period a culvert was usually constructed under the embankment containing a pipe or pipes furnished with valves which were raised or lowered as required. In many instances a tower was built from the end of the culvert near the foot of the water slope extending to top water level, and provided with valves at various stages, enabling the water to be drawn off at different heights. Other reservoirs are provided with outlets by means of a culvert containing pipes, but with a shaft for the valve spindles immediately in front of the puddle wall, which is built through the embankment to top bank level. In some cases—fortunately not many—pipes unprotected by culverts have been laid through the bank and closed by valves placed at the foot of the dry slope of the bank. In order to obviate the objections open to these methods the plan now being adopted in the construction of the New Yarrow reservoir for the Corporation of Liverpool, at the Llanefydd reservoir, and at the Wayoh reservoir for the Bolton Corporation, is to supply outlets by means of tunnels driven through the solid ground round one end of the embankment and under the end of the puddle wall or under the bank itself. At Yarrow the tunnel is 217 yards long, and 8ft. in diameter, and is driven through hard shale and lined with masonry. At Llanefydd the tunnel is 70 yards long, of oval shape, 5ft. by 4ft., and is cut through the solid rock. In both cases there is a valve shaft situated in line with the puddle trench extending from the tunnel to the surface of the ground at top bank level. At Yarrow this shaft is lined with masonry, and the puddle wall is carried round it and tied into the hill-side; at Llanefydd the puddle does not extend to the shaft, the rock in which the latter is sunk being watertight. At the bottom of the shaft the tunnel is completely filled up with a plug of brickwork set in cement and faced with Staffordshire blue bricks; in this plug the outlet pipes and valves are inserted. These should always be in duplicate to provide for accidents. At the Wayoh reservoir the tunnel mouth in the reservoir is closed by a brick wall, and the valves are placed immediately behind the wall. If the tunnel mouth be left open it should be protected with a strong iron grating, and it must be borne in mind that after the valves are once closed, and the water allowed to rise in the reservoir, this part of the work cannot be examined without letting off the water and at considerable expense.

The overflow or means of escape for those floods which the reservoir cannot contain is of equal importance with the outlet. The length of the waste weir should depend on the area of the watershed and the greatest amount of rain known to fall in the district in one day. With these data may be calculated the quantity of water which will flow over a weir of given length, allowing a maximum depth of (say) 6in. The length of the weir must be increased until the quantity of water which will flow over it in a given time is equal to the largest amount of water which can pass into the reservoir in that period. A common rule adopted in England—but one not always to be relied on—is to make the waste-weir 3ft. long for every 100 acres of watershed, and to make the width of the bye-wash to equal 1ft. for every acre of surface of the reservoir. The bye-wash or channel for conveying the water away after it has fallen over the waste weir need not be so wide as the weir itself, as the water may be made to flow through it with increased depth. The form of the waste-weir is generally that of a segmental or semi-circular coping, placed at top-water level, an opening being in most cases left filled up with planks, which can be removed at pleasure to facilitate the escape of the water. In order to convey the waste water into the old stream-course gradually, the bye-wash is usually carried for some distance down the valley. Sometimes, the floor of the bye-wash inclines, occasionally broken by steps; at others engineers employ steps broken by level landings. When steps are used the fall from one to the other should not be more than 12in., and the head of each step should equal at least twice the fall; the steps, moreover, should not have a continuous fall of more than 5ft., but should then be broken by level landings at least 5ft. long. A layer of puddle or concrete under the bottom of the bye-wash is generally adopted, and is specially necessary between the waste-weir and the central puddle wall in the embankment, to prevent the water from getting under the pitching and injuring the puddle.

All brushwood, vegetable matter, and boggy or peaty material, should be carefully removed from the interior of the reservoir before filling, to avoid discoloration of the water and increased expense in filtration. The filling of the reservoir should be performed as slowly as possible in order that the water slope may settle gradually.

Mr. Beloe's book is illustrated with some carefully-prepared diagrams of the works referred to, and his calculations supported by tables. With these, those desiring further information will do well to make themselves acquainted.

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DUNDEE.—LETTER I.

[*From our own Correspondent.*]

THE prosperity which accrued to Dundee during the American War is doing wonders for the constructive and fine arts in that "bonnie" town. The architects of Dundee, as a body, take the lead in Scotland in Gothic art; the merchants of Dundee are zealously emulating each other in their patronage of modern painters and sculptors; four public parks and a free public museum and library contribute to the rational enjoyment of its working population; its well-known fourteenth century "Town Steeple" is being restored, out of pure archæological interest; its harbour and docks are being rapidly extended; its narrow thoroughfares, closes, and dens are marked for demolition under a recent Improvement Act; over forty miles of its main sewers have been completed; fire insurance offices are, indirectly, checking the erection of non-fireproof mills and factories; its artisans are building their own homes; and the directors of the North British Railway are seeking more direct access to its industrial wealth by the construction of an iron bridge over the Tay, which will be the longest in the world.

The population of the Burgh in 1871 was 121,975, showing an increase of about 30,000 during the last ten years. In 1821 the population was 31,000 only. The Burgh forms an area of over 3,400 acres, of which more than one-half is covered with buildings. In portions of the old town the population varies from 400 to 700 per acre, while the rate over the whole area is about 34 per acre. In the densely populated districts the dwelling-houses are built in long ranges of many stories in height, separated from each other by closes, or alleys of only a few feet in width. Light, air, and ventilation have been so little regarded in the construction of these tenements that many rooms may be found with ceilings not more than 7ft. in height from the floors; with windows having about eight superficial feet of opening; and cubical areas of about 230ft. only for each resident. In these tenements are accumulated the social curses of the Burgh—ruffianism, uncleanness, and depravity, unequalled in Scotland.

The authorities, under their new Improvement Act, have the power to uproot and sweep away all these habitations; to construct new thoroughfares upon their sites, and, in one instance, to make provision for a considerable market area. They have also the power to construct slaughter-houses and public parks. The worst district in Dundee, lying between Couties' Wynd and Chrichton-street and Nethergate and Dock-street will be entirely removed. In this work 1,350ft. of closes, averaging 5½ft. in width, and enclosed on each side by dwelling-houses of four and six stories in height will be removed.

It is proposed to form a new street from the Nethergate opposite Thorter-row down to another street which will run from Union-street to Greenmarket, parallel with Dock-street, intercepting and taking the place of the present Fish-street and Butcher-row. The quadrangular space between this new street and Dock-street will form the new market space. All the streets in this district will be widened, more or less.

A new street, 40ft. in width, is also proposed in extension of Victoria-street westwards, necessitating a bridge over the Dens. This will connect the Arbroath-road and east-end of the town with the Bucklemaker Wynd. The Bucklemaker Wynd, which is enormously overcrowded with vehicles, will be widened to an average width of 50ft. The new line of street will be continued across the Hilltown by Ladywell-lane and Powrie's-lane to Bell-street and Meadowside-road. Each of the existing streets will be widened to 60ft., and their gradients improved.

Another and, perhaps, the most important, improvement will be the widening of the "Narrow of the Murray Gate." This "Narrow" is in one place 17ft. only in width, and here, on Saturday evenings, according to the universal custom in Scotch towns, all the working population of the locality assembles. This work is conjoined with the extension of Commercial-street to Albert-square by a new street 60ft. in width, and with the widening of Seagate near its junction with Burnhead. The levels of Murray Gate and the adjoining streets will be greatly improved. Another important work is the contemplated extension of the High-street, east and west, by the removal of the buildings now used as the Clydesdale Bank and the Union Hall. The latter building blocks the principal egress to one quarter of the burgh; and, in an artistic point of view, invites a speedy removal. It was built by the Episcopalians.

It is proposed to clear away one of the most ruinous and overcrowded parts of the town by extending Guthrie-street westwards to the Scouringburn, and by opening Heathfield-place to the width of Kincardine-street, so as to form a good thoroughfare between Blackness-road and Hawkhill. All these, and some other improvements, will as completely change the aspect of Dundee as that of Paris or Bradford in Yorkshire has been changed during the past few years.

Already rich in public parks, the authorities have commenced another, about 19 acres in extent, situate on the banks of the Tay, and called the Magdalen Green. To this fine spot an esplanade of considerable length is being constructed, whereby a riverside drive from the docks to the new park will be formed. The esplanade works will cost about £40,000. They consist of an outer sea wall of rough construction, designed to uphold some scores of acres of made-up land lying between the river and the Perth Railway. When this work is completed—some years hence—it will be a grand addition to the scenic attractions of the "bonnie" town. The river, or Firth, is here about two miles in width, presenting points of picturesque glories which fully realise the Highland appellation, applied to Dundee, of "Ail-lec" (the beautiful).

Forming a fine contrast to this progressing Firthside Magdalen Park, Plain, and Esplanade, is the Balgay Park, opened last autumn by the Earl of Dalhousie. As the Magdalen Park comprises the fairest of the sea-level land, so the Balgay Park and the adjoining Necropolis, together 60 acres in extent, comprise the loveliest of the hill-tops. The Balgay Park and the Necropolis occupy twin hills on the west side of the town. They are to be connected by a light iron trellis bridge thrown over the gorge between them. The lodges and walks have been designed and laid out in excellent taste. At present there is an air of primness and neat gardener's work about the general arrangements, conveying an idea of contemplated restrictions which may curtail the popularity and means for good influences of a real people's park. All around the scenery is lovely, free, broad, and boundless, and it will be a mistake to surrender the park too much to the rigid requirements of a garden. The park, lodges, and Necropolis have been constructed under the superintendence of Mr. Mackison, C.E., the Burgh Engineer, the late Mr. Scott, Burgh Architect, and Mr. McKelvie, Superintendent of Cemeteries.

The hilly character of the greater part of the town necessitates great ingenuity on the part of architects in adjusting their buildings to the sites upon which they have to work. Out of 60 miles of streets, roads, and lanes within the burgh, only about 30 miles have a gradient under 1 in 30. Altogether there are 540 thoroughfares. Three hundred of these, with a total length of 15 miles, do not exceed 20ft. in width; one hundred, with a length of 16 miles, range from 20ft. to 30ft. in width; sixty, with a length of 20 miles, vary from 30ft. to 40ft.; and eighty, with a length of 10 miles, are 40ft. and upwards in width. The "Marketgait," or High-street, is 360ft. by 100ft. There are about two miles of streets and roads in connection with the harbour, and about the same extent of quayage.

Forfarshire abounds with good paving-stones, of which the authorities of Dundee now avail themselves liberally. Five to six miles of old footways are annually taken up and laid with flagging. The steam roller is always used upon the macadamised roadways, and main thoroughfares are pitched with Whinstone blocks. The principal streets are well cleansed; the closes and dens are Augean stables, upon which little impression can be made in the way of cleanliness.

The main drainage of the town proper is nearly completed. The sewers are over forty miles in length, and will cost about £60,000. They discharge their contents at several points into the Tay, pending the maturity of a plan for utilising the whole sewage upon the sands of Barry, seven miles down the river. A large and rapidly-increasing district, of about 500 acres, called Lochee, is, at present, undrained. This work is in the hands of the Burgh engineer, Mr. Mackison, who proposes to carry an outfall sewer round the west shoulder of Gowriehill, past Invergowrie House, Hazel Hall, and the grounds of Duncarse and Dunmore to one of the main town sewers in the Perth Road. The length of this sewer will be 2 miles 5 furlongs, 6·18 chains. The gradient will be 1 in 528, varying at the east end to 1 in 40. A storm water overflow sewer, and means for sluicing and ventilating, form part of the scheme. The sewer will be constructed with strong glazed fire-clay tubes 2ft. in diameter, with water-tight joints. An official estimate of the cost of the projected improvements amounts to £200,000.

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ECCLESIASTICAL DILAPIDATIONS.

AN alteration of some importance has been made in the new Act to amend the Ecclesiastical Dilapidations Act, 1871, with respect to fees to bishops' secretaries and others, on which complaints have been made. The Act alters the length of mortgage terms, and of the conditions of the repayment of the advances. It then provides that it shall be lawful for the Archbishop of Canterbury, the Lord Chancellor, and the Archbishop of York, with the assistance of the Vicars General of the archbishops, with the consent of the Treasury, at any time during the year 1873, to review the rates of the fees of the bishops' secretaries and registrars, and the rate of surveyors' charges for work done in pursuance of the Ecclesiastical Dilapidations Act, 1871, as fixed, or authorised to have been fixed, under the 10th section of the same Act for the various dioceses in England and Wales; and it is declared to be lawful for the archbishops and other constituted authorities mentioned to ordain and establish in lieu thereof one uniform table of fees and charges, to be binding throughout the whole of England and Wales, and that they shall have power from time to time to amend or alter such table of fees and charges. The new table, or amended table of fees, is to be submitted to Privy Council before the same can be demanded, and the fees are to be dealt with by the Privy Council in accordance with the statutes in force in that respect. By the Act, a benefice is not to be mortgaged for any of the purposes of the Acts recited to an amount exceeding in the whole three years of the net income of such benefice.

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SCHOOL DESKS.

IN an article on the London School Board Exhibition of School Furniture, now open at the South Kensington Museum, the *School Board Chronicle*, of July 20th, says:—"One of the most notable forms of desk by reason of the change which it introduces in the manner of the arrangement of the children in the school-room, is that registered and exhibited by Mr. Jno. F. Moss, clerk to the Sheffield School Board. It is called the 'Sheffield School Board Desk,' and is made in pairs. Each desk accommodates two children, side by side, and no more, and the desks are ranged immediately behind and touching each other from end to end of the school-room if necessary. The pupils, therefore, sit in files instead of rows, and the teacher's passage is between the right and left shoulders of two files of students. This is a favourite plan on the Continent. It is for the schoolmaster to say whether it is better than the old method. It certainly has the advantage of giving each child free space either on his right hand or his left, and the result is said to be achieved with the same economy of space as under the ordinary arrangements." A committee of the Birmingham School Board have also reported in favour of this arrangement. The report states that, "In the American schools short desks to hold two scholars are considered preferable to the long desks commonly used in this country, and the space lost by leaving a passage between the ends of these short desks is gained in another way by the absence of a passage behind each desk so that five or six rows may be arranged instead of three.

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THE ISLINGTON GUARDIANS AND THEIR ARCHITECT.—At the meeting of the Islington Guardians on Thursday week, the clerk read a letter from the architect of the new vaccination station, Liverpool-road, stating that the work was progressing rapidly. He also enclosed a certificate authorising payment of £500 to the builder, and asking that he might be allowed £50 on account of his services as architect. Mr. Wiltshire objected to pay the architect a larger sum than what he was entitled to. They gave their architect 5 per cent. for his services, and it was quite enough that they make payment of his fees when the work was completed. It was ultimately agreed to pay the architect the commission of 5 per cent. on the certificate granted to the builder.

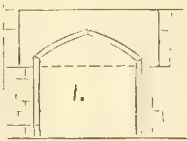
NOTES ON THE CHARACTERISTIC TREATMENT OF MATERIAL IN DESIGN. *

IT has frequently occurred to me, in looking over examples of architectural and ornamental design of different kinds, that sufficient importance is seldom attached to the consideration of the nature and capability of the material made use of, and the influence which this ought to have on its treatment at the hands of the designer. This influence, or relation between material and design, is of a twofold nature. There is, in the first place, the strictly practical consideration of the mechanical nature and structure of the material, whether granular, fibrous, laminated, or whatever it may be; its capacity for resisting decay from atmospheric influence or attrition; and the nature of the mechanical force, whether compression or tension, to which it offers the greatest resistance. These are, or ought to be, very important considerations as bearing on the style of design adopted; for certainly no design, however intrinsically beautiful, will have a satisfactory effect on the mind if it is evident that the material in which it is executed has been necessarily wasted as to its substance, or misused in regard to its ultimate strength, in order to accommodate it to the designer's ideas. And secondly, there is the consideration as to the species of design or of architectural effect which the material is most suited, from its texture or the mode in which it has to be worked, to give expression to. A design which looks very well and is very effective in one class of material, may be very unsatisfactory, and look very weak, when translated (if one may use the expression) into a material which from its coarseness or difference of texture is not adequate to express the design in its original form and character. If this be thought a truism, it is at any rate one which is very often practically disregarded. Putting together, then, the two considerations stated above, I believe it will invariably be found that, other qualities being equal, that design is best and in every sense the truest in which the material employed is used in the form in which it is strongest and most durable, which involves least waste, and in which the design is of the character which the material employed, whatever it be, is best capable of giving effect to. But we shall be able to estimate better the right or wrong of the principle assumed here by following it out in its special application to the treatment of some of the materials in common use in architecture.

Take first the consideration of stone, which, in spite of the favourite and now hackneyed dictum of some critics about this being "the iron age," is likely at least to last our time as the staple building material, wherever it can be readily procured. Now, what are the prominent characteristics of stone, considered as part of the raw material of architecture? We have here a substance granular in texture, somewhat brittle, and with a more or less friable surface, with little tensile strength, little resistance to cross strain, but a considerable, in some instances a very great, resistance to compression. Now, all these considerations certainly seem to point it out as a material most fitted for an arched construction, where it will be only exposed to compression, and where, moreover, as no blocks of very large size are necessary, there will be the better opportunity for the economical use of material in working-in the smaller portions which, under another system of construction, might go to waste. There may certainly be cases in which, for various reasons, it is expedient to use a lintel in stone construction; where it is desired to avoid the thrust of an arch, for instance, or where the square head is for some reason a more convenient form. Where this is necessary, however, it stands to reason, one would say, that the most should be made of the block which is used for a lintel; that both on grounds of economy of strength and of material, its substance should be left as solid as possible, and not weakened by being cut away in the search after what is supposed to be an "ornamental" form. Yet this very plain axiom we see continually disregarded; indeed, with some practitioners of modern Gothic it became quite a habit, a little while since (and one which is still frequently practised), to put what is really a lintel over a window, and then cut it into the form of an arch.

Figures 1, 2, 3 are specimens of forms of stone lintel not unfrequently used; in Fig. 2 the soffit is cut into a form which weakens the stone, apparently, if not really, at the point where the strain is greatest, and almost suggests to the eye the commencement of a vertical crack; and in Fig. 3, which (like the rest) is taken from an executed building, nearly half the substance of the stone is cut to waste in procuring a form which, after all, looks exceedingly weak and unsatisfactory. If this kind of form is desired for a window head, the proper way to obtain it, in stone, would be as shown in Fig. 4, which has the additional advantage of really strengthening the lintel by decreasing the bearing. Fig. 5 is a form not unfrequently met with in Gothic arcades on a small scale, where the arch is not a real one, but cut out of the solid, but always with the vertical joint at the top, so that instead of the whole spandril being cut to waste, only the small portion within the dotted lines forming the chord of the arc is lost. As a general rule, it may be said, Always take care to make enough joints in your stonework, otherwise it will make joints for itself. Fig. 6 shows a curious piece of construction, from a comparatively new building by an eminent architect (Brook's Bank at Manchester, by Mr. Truefitt, illustrated in the *Builder*, not long ago), where the roof of the *porte-cochère* is formed by very flat arches, which could not stand of themselves in that position without abutment, and are really carried by iron ┳ beams underneath, as indicated, the iron so treated as to be as little noticeable as possible. The conflict between apparent and real construction, or between construction and design, produces here a very unsatisfactory effect, the more to be regretted as it forms the only serious defect in an otherwise most admirable and original design.

So, in all ordinary masonry, that treatment will be best which avoids the unnecessary cutting to waste of the material; and most particularly is such waste to be condemned when it is done to imitate a form which should be the result of working in separate blocks. To give one instance: if a very large stone pier had to be formed, it must be built up in courses, and the bottom course would naturally be made larger to form a plinth, both for the satisfaction of the eye and for really greater stability. But it is not uncommon to see smaller piers, which, for the sake of strength, are better in one piece, worked with a plinth; in other words, two or three inches cut off the face of it for the greater part of its height, so as to leave a plinth (Fig. 7). If a thing is best, practically, as a monolith, let it be worked as a monolith, and not in imitation of a built-up pier. While on the subject of gate piers, too, we may observe how much more solid and satisfactory is the appearance of a head or finish worked out of the solid (Fig. 8), as compared with the practice of dowelling on separate head pieces or caps, with projecting angles, which are only in the way. There is, as we know, a taste among some of the youth of the period for surreptitiously lifting off these head pieces from their neighbours' gate piers; a highly commendable practice which might well be further extended. To return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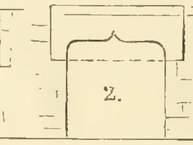
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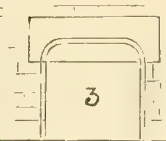
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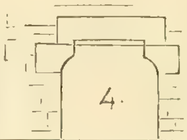
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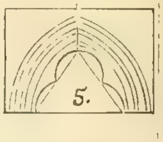
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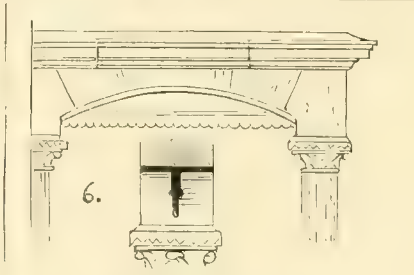
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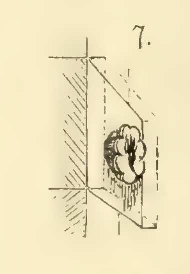
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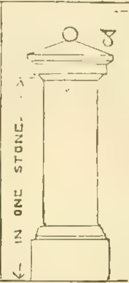
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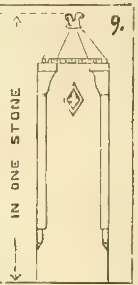
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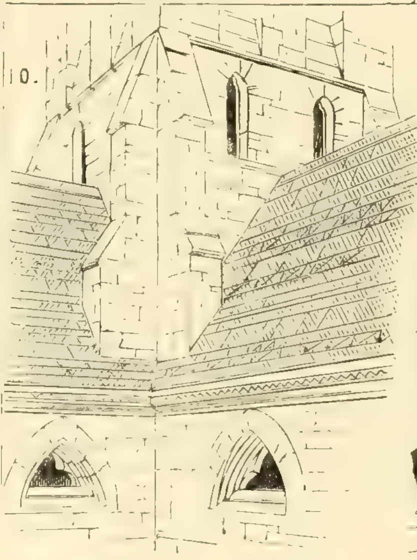
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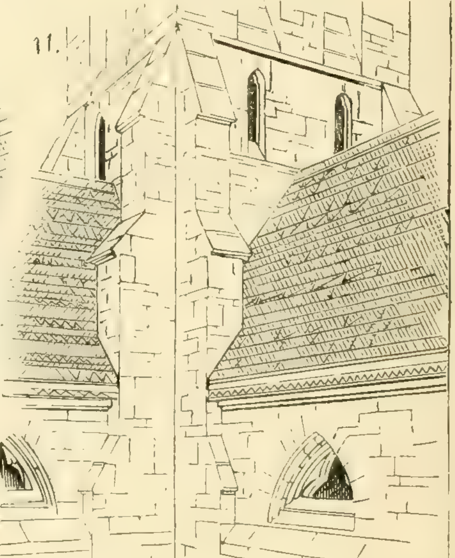
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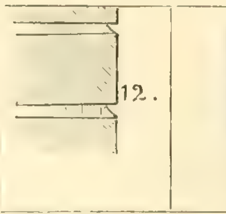
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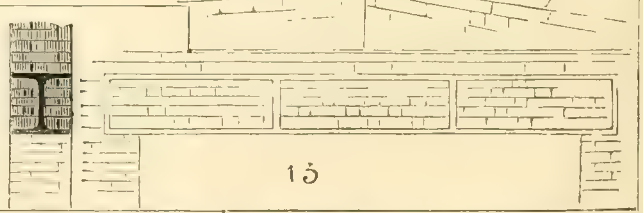
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Foliage planted on

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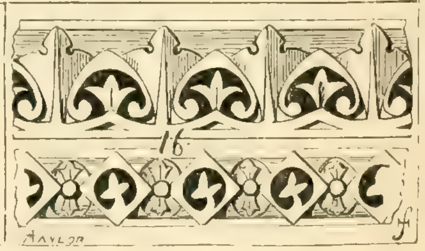
Cast solid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* Read before the Liverpool Architectural Association by H. H. Statham, Jun., Esq.

however: the same remarks will apply to the treatment of surface ornament on the face of the stone in external work. I call it bad ornament when a rosette or other such object is left standing out from a stone in the centre of its face (Fig. 9); equally so when a raised panel mould is shown projecting beyond the wall plane, and when wreaths and festoons are worked in high relief down the architraves of a window or on a column. We feel intuitively that these are to a certain extent "gimcrack," because (apart from another reason to be mentioned just now) we know that to obtain them a quantity of good material has been cut to waste on each side of them.

In addition to these minor considerations, however, another highly important point should be noted in regard to the treatment of stone as a building material. It is one of the characteristics of building stone that it is a material requiring to be cut up into cubes of convenient size for use in building, and that a stone building is, in fact, the placing together of a number of small fragments of irregular size, and sometimes irregular shape, to form one mass. Now are we, as building artists, to recognise this subdivision of our material, and consider it as a part of the whole result, or are we to do all we can to mask the fact of our building being composed of separate stones, and to endeavour to convey the idea of its being one homogeneous mass? Although I have a very strong conviction on the point myself, still I can quite understand it being considered an open question by many architects, and fully admit that there is something to be said on both sides. But I do not know whether it has been noticed how important a part this point in building plays in marking the distinction between two great and widely-different schools of architecture; and I am inclined to think that the real and fundamental distinction between Mediæval and Renaissance building is that the first recognises the subdivision of the masonry, and makes it a part of the architectural expression, while the latter school ignores these subdivisions and designs as if the whole building had been carved out of one block. In the design of most Renaissance buildings there is nothing which, so far as the design is concerned, might not be as well represented in a wood or plaster of Paris model on a small scale. In this class of building the architectural decoration is applied at certain points, and the wall space between, where not specially "treated" in any way, is merely so much blank space, trimmed off as neatly and smoothly as possible. There is for the most part nothing in this class of masonry design which would not be just as suitable for execution on a small scale in a design for a sideboard or cabinet; and we know that the designers of furniture in this style do habitually turn out objects which are in their main features miniature copies of buildings, with pillars, architraves, &c., which really look just as well in their way, sometimes better than the buildings; and neither lose nor gain anything from the absence of masonry courses, because in the building these are not supposed to be noticed or to form any part of the character of the design; they are made as little conspicuous as possible. But it is impossible to treat a Gothic building, a real Gothic building, in this way, because in it the arrangement of the stones so as to form the strongest and at the same time the most economical bond is openly avowed by the builder, and goes far to give character to his design; and no repetition of a Gothic building in a cabinet design or model would give the effect of the original, since when the masonry lines and jointings are lost, the nerve and muscle of the design are in a great measure gone, and even the purpose of some of its parts, or of the forms they assume, is hardly evident. Whether it is possible to design buildings in harmony with the general character of Renaissance art, and yet to combine with this a greater frankness and boldness in the masonic treatment,—and whether, if it were possible, it would be desirable to do so,—are questions involving very wide considerations as to architectural principle, and which I shall not attempt to go into here. But, taking the two styles as they are, there can be no doubt that, if there is any truth in the principles put forward at the commencement of these remarks, the Mediæval style of building is that which is essentially the masonic style *par excellence*, and the only one in which masonry, properly so called, has obtained its highest and most complete expression; and I believe one main cause of the weak and totally uninteresting character of the earlier modern Gothic works, of the Rickman period, is to be found in the fact that in these the characteristic treatment of masonry bond was totally ignored, and the work, between the Gothic door and window jambs, was finished with the smooth, regular-coursed, thin-jointed ashlar of the Renaissance school. And here another characteristic of what may be called true masonic expression may be noticed, also peculiarly exemplified in the Gothic style, but almost entirely in the earlier periods of that style As we use the stone in irregular sizes and shape, such as are most convenient, so our object in putting them together is to erect uniform and solid planes or masses of masonry. Now, in the earlier Gothic buildings, a great part of the effect and expression of the structure depends not at all on ornament, in the usual sense of the term, but on the juxtaposition of different plans of masonry meeting and cutting into one another at various angles. There is something peculiarly grand and monumental in the aspect of the buildings of the Transitional period in this respect, every part of the mass of the building appearing to have an intimate relation to and dependence upon the rest of the structure; buttresses running straight into the window jambs in one solid breadth of masonry; outlines formed not by putting one part of the design upon another in separate stories, but by splays and offsets which are carried from one portion of the building to another, and, by their artful combination, give a unity of expression conveying the idea that every part of the design has a relation to the rest, and could not be built otherwise than it is without a general reconstruction of the whole. Very soon, in the decadence of the style, this feeling was lost, and the later Gothic architecture became in many cases as much a mere putting together of ornamental detail as any but the worst specimens of Renaissance can be said to be; and at the Revival the later styles being first followed, the buildings of the earlier revivalists fall into the same condemnation. But since then the superior beauty and truthfulness of the earlier Gothic school of building has been recognised and emulated; and whoever has studied any of those remarkable designs for ordinary-sized churches which have mainly made Mr. Street's reputation, must perceive that the striking effect of those buildings, in which often a severity and dignity of expression is found which is rarely attained in such comparatively small works, is really due to the architect having depended almost entirely on his treatment of solid masses of wall in different planes to produce the intended expression, which in many cases is effected with an almost total absence of ornamental detail. Among the conservative Gothic architects of the day (by which term I mean those who strictly confine themselves to reproducing the old style exactly as it was), no one has better recognised the value of this method of treating masonry than our friend and former member, Mr. Paley, especially in some of his more recent works, in which the higher and more monumental character of Early Gothic is most successfully reproduced. An illustration of the difference of effect produced by the continuous treatment of masses of wall is given in Figs. 10 and 11, representing part of the "crossing" of a church with a central tower. The first (taken from a modern example) represents an evident attempt to add solidity of expression to the structure by bringing out buttresses from the tower over the main walls. But from the fact of the cornice and gutter being (unnecessarily) carried through past the buttresses, their whole effect is nullified; they are detached from the main work, and appear to sit in a purposeless manner on the slope of the roof. It seems to me that this failure might have been easily avoided by the simple expedient shown in Fig. 12, of setting back the upper portion of the main walls sufficiently to allow the gutter to stop against the buttresses, the sides of which could then have been brought down, visibly and without break, into the main walls, of which they would have formed a portion, and thus have secured that breadth and massiveness of expression which in the treatment shown in the former example has been so completely missed.

(*To be continued.*)

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THE GAS SUPPLY OF THE METROPOLIS.—At the annual meeting of the London Gas Consumers' Association, held at their offices, Great Queen-street, Westminster, on Tuesday week, a paper compiled from Parliamentary documents was read by Mr. Flintoff, their engineer, from which it appears that the gas consumed in the district of the Metropolis Gas Act last year was 11,491,820,300 cubic feet, its illuminating power 12 to 16 sperm candles, its cost to public and private consumers £2,205,308 4s. 1d., and to the public lamps alone £232,119 5s. 8d., while the quantity of coal used in its manufacture was 1,571,527 tons. It was also shown from a paper of the Board of Trade that the difference between the cost of 12-candle gas and 18-candle gas amounts to 1s. 2¾d. upon each 1,000ft. of gas sold, and that a saving of £532,534 may be effected by the London gas companies alone by the adoption of the patent process now in use, so that gas of improved quality ought to be sold in the metropolis at a greatly reduced price.

THE ARCHITECTURAL ASSOCIATION'S NORTHAMPTONSHIRE EXCURSION.

BY the renewed kindness of Mr. Edmund Sharpe, F.R.I.B.A., some forty members of the Architectural Association last week visited Northamptonshire under that gentleman's guidance. The party left London (King's Cross) by the 7.50 train on the morning of Monday week, the 19th inst., arriving at Peterborough at 10.16 a.m., from whence they proceeded by the Midland Railway to Stamford, where they arrived shortly before 11 o'clock. After partaking of refreshments the excursionists at once started for

Burghley House, the seat of the Marquis of Exeter, a very fine Elizabethan mansion, situated in a large park, the western entrance to which is graced by a very handsome lodge, erected by the first Marquis in 1801, at a cost of £5,000, from the designs of a local architect, Mr. Legg, of Stamford. It consists of two stone octagonal turrets, of three stories each, crowned by cupolas. The turrets are connected by three arched gateways, the three sides of which, being of solid masonry, are decorated with three-quarter Doric columns and niches, surmounted by a frieze, cornice, and other embellishments. The mansion itself is celebrated not only on account of its historical associations, but also in consequence of the large number of art-treasures it contains. The stone cupola-topped turrets, the singularly constructed chimneys, consisting of lofty Doric columns, the ornamental balustrades of the roof, and the quaint and substantial Elizabethan style of the mansion, are very striking, whilst the lofty spire of the chapel, rising above the whole, gives to the whole fabric "the consequence of a town." The building itself is in the form of a parallelogram, and is built of stone known as Barnack rag, which has well preserved its soundness and freshness. The erection of the mansion was commenced by the Lord High Treasurer Cecil, Lord Burghley, in or about the year 1575, on the foundation of a former house. The architect of the edifice was the celebrated John Thorpe, by whom also the house of Burley-on-the-Hill was designed. In the arched roof of one of the entrances to the central court is an escutcheon of the family arms, inscribed with the date 1577. The date 1585 appears on the spire of the chapel, and on the north front is the date 1587. The south front commands a fine lawn, with a broad expanse of water and some interesting scenery. The shrubberies and lawns were laid out by Launcelot Brown, the well-known landscape gardener, some 60 years ago. The building contains 145 rooms, many of which are spacious and magnificent, and adorned with fine old paintings by the great masters. The greatest attraction in the interior is found in the rare and choice collection of works of art, both in painting and sculpture. A magnificent feature of the mansion is the magnificent ceiling paintings of Verrio and Laguerre. The series of rooms known as the "George rooms" are all adorned with splendid ceiling paintings by Verrio. This painter, who was born at Naples in 1634, was introduced to England by Charles II., who employed him in the embellishment of Windsor Castle. The Earl of Exeter afterwards engaged him at Burghley, where he continued during twelve years, being allowed a separate table, an equipage, and a salary of £1,500 per annum. Laguerre was one of his assistants. The programme of the visitors precluded the possibility of a long stay, and there was only time for a hasty glance at the treasures of the princely mansion.

From the house the party adjourned to the "George" Hotel, Stamford, for lunch, after which Stamford S. Martin's, S. Mary's, Brown's Hospital, S. John's, All Saints', S. George's, S. Leonards, and Free School, Whitefriars, &c., Stamford, were visited. The dinner took place at the "George," and in the evening an address was given by Mr. Edmund Sharpe on the nomenclature and characteristics of the various styles of English architecture. A report of this will be found on another page. Thus was concluded the first day of the excursion.

SECOND DAY.—TUESDAY, AUGUST 20.

On Tuesday the party started at 8 a.m., and after visiting the churches of Uffington, Tallington, West Deeping, Market Deeping, S. James Deeping, Northborough, and Etton, proceeded to

Helpston.—The church here contains examples of many styles of architecture, and in curious juxtaposition. There is a chancel, with priest's door S., nave W., north and south aisles and clerestory, south porch, west tower, and spire. The aisles extend west as far as the tower. The whole of the tower has been recently rebuilt, and at the same time three arches communicating respectively with the two aisles and the nave were also rebuilt. The capitals of the arches are genuine Norman work whilst their two corbels possess the Early English character, and the arch is Transitional. Mr. Sharpe said he was exceedingly puzzled to make out—not knowing it was modern work—how Transitional work could be built with the Norman work. It now appeared that in the restoration Transitional work had been put with Norman work. Every portion of the tower is extremely well-built. There is a pretty arcade in the Lancet portion of the building, and an admirable Transitional doorway, with the Transitional volute at the top of the capital. The arcade, which has a circular arch, is scarcely out of the Transitional period. An arcade of three arches in the chancel is supposed to be an Easter sepulchre. There is a great deal of Lancet work in the piscinæ and sedilia. The east window of the south aisle is a most charming Curvilinear design, and beneath it is a stringcourse adorned with the ball-flower—the ornament of the period. The chancel has evidently been as high as the nave, the window heads having been cut off. During the late restoration, the foundations were found to be Saxon—long and short work being found 5ft. below the surface on the north, south, and west sides of the tower. Some sepulchral slabs also were found in the masonry of the tower above the level of the aisle roof. Several of these have been preserved. Mr. Bloxam pronounces them thirteenth century work. There is a square tower which dies into an octagon, and this is surmounted by a low spire. The upper part is fourteenth century work; and of about the same date is the market cross—the head of it is gone—which stands in the centre of the village. The party then proceeded on to

Bainton Church, where there is some good Early Lancet or Early English work, and also Curvilinear (Late Decorated). The north ground story is Early Lancet work; the south side is Curvilinear, the chancel arch being of the same character. There are fine sedilia, and in the chapel attached to the south aisle there is a handsome monumental tablet by R. Westmacott, R.A. The font, which appears to be of two dates, the Lancet and Curvilinear, was very much admired. The church consists of a tower and broach spire, nave, south aisle, and chapel and chancel.

Barnack Church, which was next visited, is famous for its Saxon work. The tower arch is supposed to be Saxon. Mr. Sharpe said all they could say was that the style and period were *ante*-Norman—*i.e.*, earlier than anything the Normans brought over to England. There is work belonging to the same style and period at Earl's Barton and Barton-on-the-Humber. Outside is the remarkable long and short work, one of the principal tests of Saxon work. Rickman gave the name of long and short work, and he was the first to discover and point out the peculiarity of this group of churches; and now they were finding out other instances of similar work. He found two churches in Sussex, which had been never before noticed, containing Saxon work. As a sample of Saxon work the arch is unique. There are two remarkable ground stories, north and south, most admirable samples of the Transitional period. The north story was the earlier, and though there was not a trace of Norman work, the zigzag was borrowed from the Norman. Here they must remark the prevalence of the circular arch. There were three arches of very wide span. He never saw a Transitional arch of such remarkable size. The transparency of the church was remarkable, considering it was so early. It was almost as transparent as one of the Rectilinear churches of the fifteenth century. In the south arcade they had the banded shafts and the nascent foliage of the Lancet period coming out in great relief. It was too stiff and too strongly attached to the body of the capital to be totally free from Transitional influences. There was the beautiful porch, and as if to give them mark of the period, they saw in one of the arcades—there was an arcade of four arches on each side—the Transitional volute which prevailed only twenty years, and which was stamped on the columns as much as to say, "It would not be perfect without me." The east window was a very remarkable one; it was Curvilinear. It was late in the period, and the marks of lateness were still more marked in the sedilia and the piscinæ, which had so much of the degeneracy of treatment which was found in the following period. The church had been restored in an admirable manner, but he (Mr. Sharpe) perceived that the tools had been used in moulding too freely. The fault was not in those who directed the restoration, but in the senseless workmen who had put in their chisels and damaged the authenticity of the mouldings.

The Rev. Canon Argles said he had directed that the carding tool only should be used, but he could not always be on the spot. He also said that a few years ago he went down to the Saxon floor. It was then found that there was a wall 3ft. thick, which completely closed the old tower arch (now open), and evidently put in by the thirteenth century people, apparently to strengthen the tower, so that they could build an Early English spire. The room under the tower was used as a place of assembly. His own idea was that the King of Mercia administered justice there, because in Saxon times justice was administered as well as meetings held in the west end of the churches. There was a quantity of *debris*—apparently of a burning—remaining there, and he found that the Early English builders had accepted that as their floor. On clearing away the *debris*, he found a stone which to all appearances had helped to form a seat, the ashes of the wooden sedile, which was placed upon the stone or rizor, having been found, and also the molten lead by which these were fixed together. There would be space for twenty or thirty people in the room. The rev. gentleman also referred to the story that the church was burnt by Sweyne, and that Canute built the tower to repair the damage done by his father. This finds some confirmation in the supposition of Sir Henry Dryden, Bart., who in 1850, referring to the convoluted ornament of the small window on the south side, said he thought it was Danish work, a conclusion which he had arrived at from seeing some representations of Danish carving in a book printed some 150 years since. He suggested that the large carved stones built upright into the wall in the centre of each of the south, west, and north sides were also Danish work.

The inspection of this church agreeably concluded the second day's work, and the party returned to the "George" at Stamford to dinner.

Third Day.—Wednesday, August 21.

On Wednesday the excursionists left Stamford at 8.20 a.m. by train for Elton, where the carriages met them. A pleasant country drive brought them to

Fotheringhay.—About the church here Mr. Sharpe remarked that there was very little to be said, as its architectural history was so plain and self-evident. There were none of the intricacies or perplexities which afforded such pleasant entertainment and gave ground for investigation as they found in some other churches. It was an example of the best work of the Rectilinear (Perpendicular) period. Every part of the work was good of its kind. There is under the tower a very good example of fan tracery groining. The font is bold and well-designed. The plan of the church is of great extent. It is a collegiate church, the college being supposed to have existed on the south side, and communicating with the church by means of cloisters. There is only a nave and north and south aisles with tower; but there are apparent evidences of a chancel. Specifications for a chancel are existing, but there is no actual proof that there ever was a chancel. Within the communion rails are two monuments of the Renaissance period—the one erected to Richard Plantagenet, Duke of York, nephew to Edward, Duke of York, and father to King Edward IV.; and the other in memory of Edward, Duke of York, slain at the battle of Agincourt. These are stated to have been erected in 1573. There are flying buttresses, with crockets and finials, on either side of the church—very fine examples of the period. The tower is octagonal, a crocketted pyramidal ornament rising from each angle. The church forms a prominent and interesting feature in the landscape for a long way round.

Warmington Church was next visited. Mr. Sharpe said it was really remarkable how, in going through a series of churches of this kind, they saw the important part which was played by English architects of the Transitional period. Here they had a very interesting church, the chief interest of which was due to the ground story on each side. It was the best portion of the church, excellent as it was in all respects. It was a ground story of the Transitional period—that inventive period from whence all that was comely or beautiful in the next period was suggested or designed. There was the Transitional volute, with both larger and smaller terminations in the leaf. There were good illustrations of the Lancet period, the clerestory windows with the cusp foliation coming in approaching the Geometrical. The wooden vaulted roof of the Early English (or Lancet) period is somewhat remarkable. The tower and spire (broach) are fine examples of the Lancet period; as is also the west doorway, about which there is a profusion of the tooth ornament, this ornament being alternated in the outer order with the patera, a flower ornament. The whole of the belfry windows and the three tiers of spire lights are also largely adorned with the tooth ornament. From Warmington the route lay to

Tansor, the church of which place contains work of no less than five out of the seven periods of English architecture. All periods are represented excepting the Norman and Saxon. A portion of it, said Mr. Sharpe, passes current as Norman. They had learnt to distinguish between the work built under the Normans and that which was due to genuine English architects. The ground story of the west part of the nave is Transitional, as is also the north door and lower part of the font. The east part of the nave is Lancet; as are also the chancel and double piscinæ and the tower arch. Three windows in the south aisle are Geometrical. One window in the north aisle and the upper part of the font are Curvilinear; and the east window is Rectilinear. In the Lancet period the church appears to have been entirely remodelled. The font is rather interesting, the supports being Transitional, and the upper part having the ball-flower of the Decorated period, but of an enormous size. There are some splendid old seats, said to have been brought from the collegiate church at Fotheringhay, and there are twelve more at Hemington Church, amongst them being the dean's seat. The next stoppage was made at

Cotterstock Church, the chief feature of interest in which is the chancel, which is a very admirable work of the Curvilinear period. There are very few parish churches to surpass this at the east end, which is bold and spirited in treatment, the number of cusps producing very singular foliation. The work is of pronounced ogee character, and the window shows a very peculiar and beautiful form of Curvilinear tracery. There is a Norman doorway at the west end, and a north porch of the Rectilinear period. The nave is Late Transitional or Early Lancet, but is not to be referred to as an example of any great value. The tower arch is of the same date. There are five specimens of sediliæ and a piscina, with ogee arches crocketted with finials. The roof of the porch is groined, and the bosses are very interesting, the central one being the Holy of Holies, and four others, representing as many of the apostles. The examination of the church having been concluded, luncheon was partaken of by the excursionists, who next visited

Polebrook Church, which Mr. Sharpe designated the gem of the valley, and which comprises the most exquisite examples of two periods in the greatest perfection. He was of opinion that it would be impossible to point out a more beautiful arcade in any cathedral in the country than that in the north transept, either having regard to the beauty of arrangement or the richness of the moulding. The north side is all that is left of the Transitional church. Speaking of the circular arches, Mr. Sharpe said there was great beauty in them, and he thought it quite possible we might yet recur to the circular-arched style, and produce some great results even in the present day. There is a prettily-proportioned tower and spire of the Lancet period, and a very beautiful triplet at the east end, as well as an extremely fine double piscina with the dog-tooth very peculiarly arranged in arches. There is, too, a beautiful corbel-shaft, which carries the arch between the north aisle and the transept. The foliage of the shaft capitals of the doorway is specially noteworthy. The Transitional work Mr. Sharpe dated *circa* 1155, and the Lancet as *circa* 1230. In the Transitional work there is the volute.

At *Barnwell S. Andrew*, which was next visited, is a church which may be described as altogether Lancet, except Curvilinear windows and the spire. There is a reredos, too, at the end of each aisle, of Curvilinear date, and of very remarkable work. The corbel-shafts which support the chancel arch, and the richly-moulded capitals, form a good example of Lancet work of the very best kind. Mr. Sharpe termed it a little model church. An organ chamber is now being built into the chancel, which was, therefore, seen at great disadvantage. Having at the invitation of the rector, the Rev. — Huntingford, partaken of some light refreshment, the party proceeded to

Titchmarsh Church, the tower of which, with its many pinnacles, forms a conspicuous object in the landscape long before it is reached, and constitutes the special feature of the sacred edifice. There is a little Norman door-head in the chancel, which is the earliest relic remaining of an earlier church. There are three compartments of the Lancet period on the north side. There is a very singular illustration of the same period on the south side. Late in the Curvilinear or Rectilinear period the church, Mr. Sharpe thought, had been entirely rebuilt. There were the responds on each end of the Lancet building. The north doorway is Curvilinear, and also a piscina, and the hagioscope is of the same date. The reredos is very choice in design and workmanship. In the centre is a splendid jewelled cross, flanked by effective carvings in *relievo* of Abraham offering up his son Isaac, and Melchisedec's offering to Abraham. This is the work of Messrs. Powell & Earley. A handsome painted east window is by Hardman. Having been entertained at tea by the rector, the Rev. F. M. Stopford, carriages were taken to Thorpe station, and the journey was continued by the 5.40 train to

Oundle.—The church here is a truly grand example of the Geometrical period, but very early in the period. The most remarkable feature about the church, said Mr. Sharpe, is the number of windows which exist, commencing with coupled lancets, and ending in the fully developed Geometrical tracery. The bases and pillars of the arcades, as well as the arches which rest upon them, are magnificent. The north and south transept belong to the same period, as also the chancel, with the exception of a Rectilinear window which has been inserted. The clerestory of the nave is Curvilinear. The tower, which is of magnificent design, belongs to the Late Curvilinear period. The delicate treatment of the buttresses, thin but very becoming, much more refined than is generally found at the Curvilinear period, carried up to the top without any connection with the four noble octagonal turrets that rise from the parapetted battlement, and pierced with the cross, is worthy of notice. The spire was rebuilt in the seventeenth century, which will account for the novel crockets, which are flat, and look like steps for the "Steeple Jacks" to go up to repair the vane. Mr. Sharpe also called attention to the noble pedestals on which the piers stand, as well as to the admirable moulding of the bases, the treble roll, but the hollow between. There was the nail-head in the capital—very common in the Late Geometrical and the beginning of the Curvilinear period. The north arcade, he said, was the most magnificent one they would have in the whole series of churches to be visited. The church has been most admirably restored—a circumstance at which they would all unfeignedly rejoice. He had examined it, and had found no trace of any damage to the masonry by tools. That reflected great credit on the Rev. Mr. Nussey, the former vicar, who deserved the thanks of every archæologist and architect. There is a good fourteenth century pulpit, disfigured by gaudy colouring, and a fifteenth century brass lectern, which is said to have originally belonged to Fotheringhay Church, to have been taken from thence by the Puritans, thrown into the river, and afterwards fished out and brought to Oundle. A piece of old Norman work has been inserted for preservation in the chancel wall. It is suggested that possibly there may have been a Norman chancel. There is a splendid reredos with battlemented moulding. The centrepiece is a representation of the Last Supper, composed of alabaster incised and inlaid with pale chocolate cement, the treatment being very effective. On either side is an arcade of two cinque-foil arches, with marble shafts and foliated capitals. The spandrels of the arches are enriched with natural foliage—the passion flower. In the chancel, too, are Decorated (or Curvilinear) sedilia, three in number, with cinquefoil arches surmounted by flat ogee arches, with crocketted labels and finials. There is a fair specimen of the ornamented cusp—the ornament being the patera. The church was greatly admired, and after dinner (which was served at the "Talbot" Inn), by the kindness of the churchwardens it was lighted up, when a second visit was paid, and Mr. Statham, of Liverpool, a member of the party, delighted his fellow excursionists by a performance on the organ, and thus terminated the third day of the excursion.

Fourth Day.—Thursday, August 22.

On Thursday morning the excursionists started from Oundle by the 7.14 train for Thorpe, where they were met by the carriages. After inspecting the Tithe-Barn at Thorpe (which Mr. Sharpe was of opinion was not originally a tithe-barn) they proceeded to

Aldwinckle All Saints', a church of three compartments, of the Lancet period, and having the nail-headed ornament in the south side. The east window is almost Geometrical. Mr. Sharpe gave the date as being between *circa* 1230 and *circa* 1250. There is a small tower of the Rectilinear period extremely well-built. The tower arch is a good one, of the same period, but this is plastered up, and an uncomely gallery occupies the front of it. The blocking of the tower arch hides a west window of three lights, with Rectilinear tracery. There is an admirable west doorway, of the Rectilinear period. To

Alwinckle S. Peter's is but a short distance. The church was originally Transitional, and one of the capitals decidedly belongs to that period. There are illustrations of Lancet work. The tower and spire was added in the Curvilinear period, of which it is a pretty example, being of admirable proportions, and exceedingly well designed. It is a broach spire. It was about that time when the chancel was built. There were three original windows in the chancel, and probably a fourth. The window in the chancel arch has been lengthened, the addition being divided from the original by a transom. The Perpendicular architects, for the purpose of lightening the church—and from the increased use of stained glass if became absolutely necessary—took out the Lancet windows, and put in their broad lights. The east window, which is Rectilinear, contains some fine specimens of painted glass, late in the fourteenth century. The rector, the Rev. Henry Ward, pointed out that two of the quatrefoil compartments of the window contained memorable effigies of the rectors of the parish. One bore the inscription "Orate pro anima Rogeri Travers condam rectoris istius ecclesiæ;" the other, "Orate pro vite Wilmi Luffwick [Lowick] rectoris istii ecclesiæ." Mr. Ward said he had never met with anybody yet who had seen another instance of the spectator being asked to pray for the life; of course there were many instances in which the request was "pray for the soul." The rector, for whose life the request for prayer was made, was living at the date of the glass—viz., 1350—1380. Quaint Thomas Fuller, it is said, was baptised at the font which now exists in the church. The church is greatly in need of restoration, the lower arch being blocked up.

Lowick Church, which was next visited, belongs entirely to the Rectilinear period. It is an excellent design of the period, and of the plainest possible character. Mr. Sharpe said they seldom saw a church designed in the Rectilinear period in which the piers were so low, and the arches and mouldings so plain. The tower is the noblest part of the design. The octagonal lantern on the top of the tower is very graceful in design. The restoration of the church has been carried out in an excellent manner. There are some very fine monuments in the Dorset Chapel, and in the chapel adjoining the chancel.

Of *Islip* Church, which was the next stopping place, Mr. Sharpe said there was little to be said, as it told its own story so completely. It is Rectilinear, but better in taste and style than the last visited, and a little later. The nave is extremely high in proportion to its width. There is a good stone porch and south doorway to the chancel. The tower and spire are very good. The Rev. N. P. Lightfoot, the rector, asked Mr. Sharpe's opinion as to whether the lower stage of the tower was not older than the period mentioned, the buttresses being built up at the same time as the top stage of the tower and spire. Mr. Sharpe was of opinion, from a minute examination of the work, that it was not later, and that it belonged to the same period as the other part of the church, notwithstanding the rubble work apparent. There is a very handsome reredos, with coloured tiles over the communion table, flanked by diaper work, bearing in *relievo* the symbols of the four Evangelists. The party then proceeded to

Woodford Church, the earliest portion of which the north ground story of the nave, belongs to the Transitional period. On the north side, Mr. Sharpe remarked they had a series of foliage of the deepest interest—the early nascent foliage belonging to the Transitional period, stiff and heavy, but yet what gave place to the foliage of the succeeding period. There was the circular arch, an arch which was invariably retained where the stones of the top of the arch were not too parallel. It was only in large cathedral churches, where the span was great, that they did not venture the circular arch. Of course, the pointed arch was really originated in Euclid—namely, by the intersection of two circles. Ultimately, from being adopted for utility, it was adopted in arcades, doorways, and windows, as an ornament. The rest of the church was a real puzzle. It was taken hold of by the builders of the Lancet period, to which the remainder of the church belongs. Noticing the circumstance that there are two chancel arches about the length of a chancel apart, and both of the Lancet period, he suggested that the difficulty was as to whether the present chancel was a prolongation of the portion between the two chancel arches, or were they to understand that that portion was put in as a choir? In the south aisle was one of the most beautiful porches of the Lancet period. Every bit of it was valuable, and it was of excellent workmanship. There is a curious monumental arch belonging to the Curvilinear period or late in the Geometrical. It has the mask corbel, which in other countries would be taken as an evidence of antiquity, but in this country it is used from the Transitional to the Rectilinear period. In the south aisle is a recessed arch, which covered the effigy of the founder. There is a curious arcade of the Lancet period. Adjoining the south porch is a singular apartment, which appeared to be coeval with the church. It might have been an enlargement of the porch.

Ringstead Church was next visited. Here, Mr. Sharpe pointed out, they had not the column, but the clustered pier. He did not know a more elegant arcade than the one they had in this church. It consists of four compartments and a half. The alternate use of the red and white stone in the arches was rather curious, but the alternate use of it in the capital was still more singular. Although all carrying about the same profile, the arches were of different heights. The date of the arcade would be about 1230—the Lancet period. The tower and spire were of the same date, and any one seeing the Lancet window from the outside would be struck with its peculiarity and singular beauty. The chancel was of the same date, as nearly as possible. The church had only one aisle—an example rare in the Midland Counties. The inner doorway is certainly of Lancet period. The groinings, however, were so rude that he would not put a date to them, either the Norman or the Perpendicular. The Lancet period had covered this county with churches, the great architectural movement which resulted in that commencing in 1230 and ending in 1250. The next great architectural movement was about 1450, and between the two periods we have some beautiful examples of the tracery of the Curvilinear period in 1315—1360. Mr. Sharpe remarked that the horizontal alternation of the red and white stone was contrary to the true spirit of Gothic architecture, as it tended to bring the building down, whilst the spirit of the style was to carry the building up. Proceeding to

Denford Church, Mr. Sharpe said that it had an admirable ground story, the proportions of the arcade being much better than the last for parish purposes. The tower is a good example of the Curvilinear, bordering on the Geometrical, with four remarkable short pinnacles which are original. The chancel is of the same date—the whole forming an admirable model for the plan of a parish church of the present day. There was a remarkable arcade in the chancel, but the use was uncertain. Over it, however, is a series of apertures, which had consisted of pots encased in masonry. The rector, the Rev. F. P. Sandilands, stated it was said they were for acoustical purposes, but Mr. Sharpe could not understand what relation acoustics had to those four apertures. He referred to another place where similar apertures had been found, some eight or ten in number, and there charcoal was found. A great many theories were formed upon them. The charcoal might lead possibly to a supposition of another kind. Were they used simply for the purpose of containing heated charcoal to warm the part of the church where they were placed? The apertures were heated from time to time with fresh supplies of charcoal. Pots had been used as the best non-conductors of heat. Mr. Blashfield, a member of the party, said the neck or mouth of the pot was at the back, so that the broadest end was towards the chancel, the bottom having been broken out. It was also suggested that the cavities might have been intended for the purpose of building relics into the wall, or that they might have been used as pigeon-holes, an instance being cited of a chancel, even in the present day, being used as a columbaria. Mr. Sharpe, after having congratulated Mr. Sandilands, on the beautiful restoration which had been effected here, as at Ringstead—no tooling of the masonry—pointed out the screen of the vestry as having been coloured by Mr. Sandilands in the same way as it was originally coloured. The blue and chocolate were what they found on the early work. In restoring it, Mr. Sandilands had only done the correct thing, but it showed them that everything their forefathers did was not worthy of imitation.

Raunds Church was next visited. Before entering the fabric the splendid tower and spire were examined and described by Mr. Sharpe in detail. He pointed out the arcades, in three, four, and five heights, as being especially noteworthy. The W on the west side of the tower he did not think was intentional, but accidental, and meant nothing. The ground story of the double portal is extremely beautiful, and they found it repeated at Higham Ferrers in the next period. It was useful to have such good examples removed from each other by about forty or fifty years. The whole tower and spire would contrast, not only with Higham Ferrers, but with that of Oundle, which is of a still later period. In those three examples they had three of the very best examples, respectively, of the Lancet, Geometrical, and Curvilinear periods. They would notice the double two-light window in the belfry stage. It was worth remarking that this tower, having got its reputation, became the type of all the churches which they would see on Friday, and of others they had already seen. The proportions of the tower and spire were seen to better advantage at a distance. In estimating the proportions of a tower and spire the most beautiful point of view was that at which they arrived after they had passed the full front of either of the sides and when they saw one-fourth of the adjoining side. Then the broach and the spire-light windows, and the relation of the tower to the spire, were always more beautiful, in his opinion, with rare exceptions. In modern work they often found the great blunder committed—and that, too, by leading architects—of making the finial at the top of the spire much too large. In all the best instances of old work he knew it was comparatively small and delicate, and added to the apparent size and elongation of the spire. The spire did not belong to the same date as the tower, which is Lancet, but to the Geometrical, there being an interval of about fifteen or twenty years between the one and the other. Inside the church Mr. Sharpe drew attention to the weather-moulding above the tower arch, which is blocked up, and to the shafts coming down from the tower. That led to the inevitable conclusion that the original parish church was small compared with the grand tower built against it. The original parish church could not have been more than 3ft. higher than the top of the present arches. The tower only showed what sums were laid out in former times by the pious inhabitants of a district upon what could really only be looked upon as an ornament of the church. The tower and spire in most of these churches completely overpowered and overwhelmed the rest of the building. The present ground story on both sides appeared to be later than the tower to which it is attached. The work in the chancel appeared to be very little later than that of the tower, so that the church must have been of very great length if the chancel were as long as at present. But it appeared as if the chancel arch had been removed, lengthening the nave by one and a half arches. The east window is of the Geometrical period. There were never cusps in the window, he believed. It was the largest window without foliation that he knew of. There was one at Grantham of five lights, but this was of six. The action of the roof on the north aisle was to thrust the arcade into the nave, and to force the outer wall outward. He recommended the parishioners to pay speedy attention to it. With regard to the present state of the church, nobody could, after the beautiful restorations they had seen, see it without lamenting its condition.

At *Stanwick* Church only a brief stoppage was made, as the time was short. The tower and spire are the beauty of the church, and are unique, this being, probably, the only church in the kingdom in which the octagon is preserved from the base. Inside the church the south arcade claims attention for its beauty, whilst in the chancel is a sedile and piscina worthy of note. The excursionists next proceeded to

Wellingborough, where they dined at the "Hind," after which the church, which had been lighted up for the occasion by the kindness of the churchwardens, was visited. The nave of this church belongs to the period which seems peculiarly that in which all the churches of the valley were built, namely, from 1230 to 1250. The window at the east end of the chancel is one of the best designs of the close of the Geometrical period that we have in the country. The window is of five lights, and contains a large centre-piece filled with six foliated perforations, of which the three largest are tri-foliated trefoils, and the three smaller ones trefoils. The east end of the church is flanked with buttresses of graceful proportions, with panelled copings. The next important work is that of the Rectilinear period, in which the north and south aisles were added to the choir—somewhat late in the period. The piers, capitals, arches, and bases are all remarkably graceful examples of the work of this period, although approaching toward its close. We must not forget to mention the Late Norman doorway of two orders on the south side. The porch which covers it is of much later design, belonging to the Rectilinear period. With the examination of this church a very good day's work was brought to a close.

In our next we hope to be able to give some account of the remaining two days of this interesting tour.

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It is stated that the old chateau of William the Conqueror, situated on the Normandy coast at Bonneville, was put up to auction the other day, and knocked down for a moderate price. In latter days the chateau was used as a prison by Richard Cœur de Lion. Under Francis I. it was a hunting lodge, and now it is a ruin.

EARLY NORMAN IRONWORK.

THIS interesting and curious example of ancient ironwork is doubtless the oldest in the country, some ascribing it to the Saxons, but in all probability it is of Norman workmanship. It is the north door of Willingale Spain Church, and has a reveal of about 9in. without any moulding whatever, and considering its position (external) is in a good state of preservation. The church of the adjoining parish, Willingale Doe, stands in the same yard, and is separated from it only by a path, without rail or fence, being the only instance of this occurrence in the county of Essex. H. M. Mavor.

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FREE MIDDLE CHURCH, GREENOCK.

ONE of the latest additions to the architecture of Greenock—and these have been numerous during the last few years—is the above church. The situation which it occupies is open and commanding, adding great effect to the design, whether as seen from a distance or near at hand. The style of the building is a simple but impressive treatment of Roman architecture; bold projections cast pleasing shadows on the broad wall surfaces, and pinnacles of varied size and outline with the campanile make the sky-line attractive and interesting. The campanile, designed for a clock and bell, is graceful and well-proportioned, the lantern being especially fine in detail. The ceiling and walls of the interior are of richly-panelled plaster work. The seating is arranged in a convenient manner for Presbyterian worship, a gallery extending round three sides, and we understand the heating, ventilation, and acoustics have been managed with great success. The whole effect of the interior is pleasing, and we can imagine it to be a most comfortable meeting-place for the worshippers. The cost was about £12,000. The architects are Messrs. Salmon, Son, & Ritchie, of Glasgow.

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ARCHÆOLOGICAL EXCURSION OF THE BIRMINGHAM & MIDLAND INSTITUTE.

NEARLY a hundred of the members of the Institute had a very pleasant excursion to Tewkesbury and Deerhurst on Tuesday week. Leaving Birmingham at 8.45, the party arrived at Worcester and proceeded to the Bridge, where a steamer was moored, and the pleasant run down the river Severn began. On arriving at Tewkesbury the party proceeded to the Bell and Bowling Green Hotel, where dinner was served. On assembling in the Abbey Church, Professor Chamberlain, standing at the lectern under the great central tower, proceeded to describe the building. He showed that, like all similar buildings, it was really history in stone; that the knowledge, and skill, and taste of its various builders during nearly eight hundred years might be distinctly traced; that the huge round pillars, "massy proof" and rounded arches, were marked relics of Early Norman style, and that in the later centuries each generation of artists had left its mark. He showed how the problems, then as now, were structural more than ornamental; how the difficulty of supporting a large and lofty roof led to the division into nave and aisles; how the lean-to roofs of the aisles left blank dark spaces which were perforated to look into the nave, and to form the triforium passage running round the church over the arches and columns; how the line of lights above the aisle roofs became the clerestory windows to light the nave; how thus a Gothic building was really made lighter inside than any of the "Classic" buildings like S. Paul's. He showed how the graceful intertwining of the vaulting ribs of the ceiling, with their richly-carved bosses and so many quaint designs, were not merely ornamental but really structurally needful as enabling the builders to support a large and heavy roof by the smallest expenditure of material and weight. He showed how the fashion of buildings had changed, since now-a-days a building, when "restored," was recast in its original style, but our fathers, wiser than ourselves, knew that real "restoration" was a hopeless dream, and, believing that their own style, the outcome of their own intelligence, necessities and tastes, was always the best, did not hesitate to replace an old Norman open roof with the vaulting of the fourteenth century, and to place on Saxon arches Early English and other works of their own special time. Hence, the history of such an Abbey Church was written for all to read, and although whitewash had hidden details, and later meddlers, with equal belief in themselves, but less knowledge and less taste, had transformed much and destroyed much, such an Abbey Church was a noble work, and a glory in the history of art. He pointed out some exquisitely-designed and richly-carved *sedilia*, which well deserved to remain untouched by the "restorer," and with all the tints of time upon them as a glory and a grace to the church. Professor Chamberlain then conducted the party round the chapels, and described the monuments and the endless details of the church.

The short voyage to Deerhurst commenced soon after 5 p.m., and a large portion of the visitors landed and strolled over the fields, to see an apparently modern and unpretending-looking church, which, however, is one of the most remarkable examples of ecclesiastical architecture, as it has so much left of real Saxon work. Mr. J. R. Holliday, being asked to give an *impromptu* account of the church (as there was not time to read a very valuable and exhaustive paper which the vicar, the Rev. G. Butterworth, had kindly lent), briefly showed how the tower and chancel were real Saxon; how the curious double light in the tower was curiously complete and probably unique; how the chancel seats ran all round, and the altar was placed in the centre; how the "headings" of the windows and the perforations in the walls were triangular; and how many of the details and much of the masonry was at least eight centuries old. As the party strolled about the church, the double-light in the tower was noted, as showing very curious marks of mere copying of "Classic" ornament, showing, as Professor Chamberlain remarked, that in matters of taste we are mostly Saxon still, and ready to copy what is supposed to be ornamental, whether it is appropriate or useful, or not. Outside the church the great height of the ridge-mark of the ancient roof, the curious "herring-bone" masonry of the tower, the rude quaint ornaments of early days, were examined with much interest.

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THE OXYHYDRIC LIGHT.

IN relation to the oxygen light of Tessié du Motay, of which mention was made in these columns some time back, it may be stated that M. P. Thomas, acting under instructions from the Paris Society of Civil Engineers, has recently presented to this body a report upon the process. This report simply treats of technical advantages and disadvantages, leaving out of sight the economical question, which is somewhat to be regretted in view of the indistinct statement of the causes which have led to its removal from some of the streets of Paris where it had been introduced. The conclusions arrived at are the following:—

(1) Theoretically, the combustion of oxygen does not increase the illuminating power of a given volume of gas.

(2) Practically, however, it enables a burner to consume four times the quantity of gas that can be burned in air, without detriment to the utilisation of the light which may be developed. In particular, it utilises the entire luminous capacity of the gases, however rich, and in almost any quantity.

Consequently, it would be disadvantageous to employ it for ordinary street-lighting, on account of the limited quantity of gas consumed by the burners, the only advantage gained being the beauty of the light, provided the gas is very rich. (Here, unquestionably, would come in the objection of expense from the complication of the apparatus.) But it is very advantageous, and the more so in direct proportion to the richness of the gases employed—for great centres of light (sun-burners, &c.), where a large volume of gas is to be consumed without loss.

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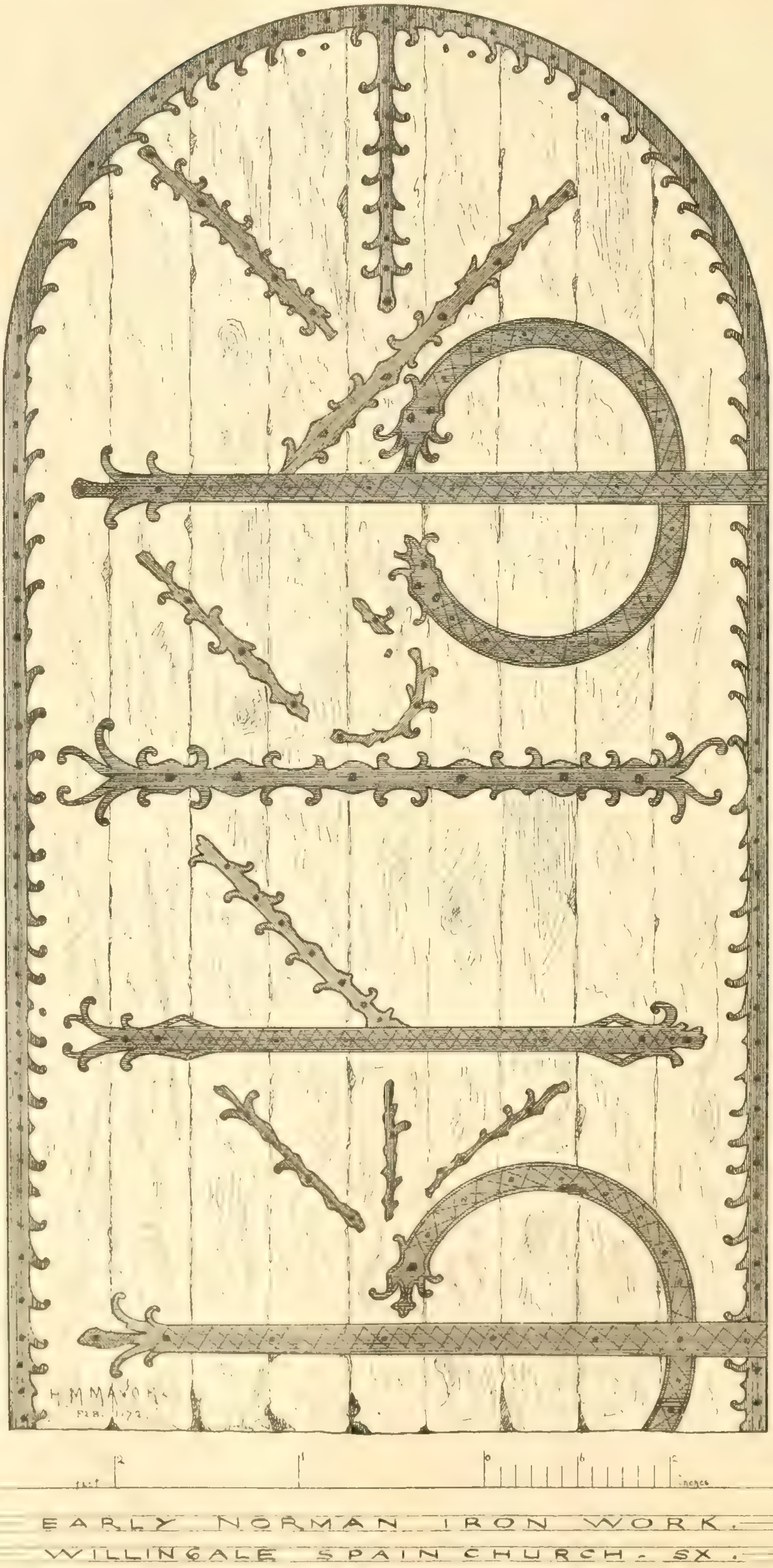
HOW TREES ARE KILLED BY LIGHTNING.

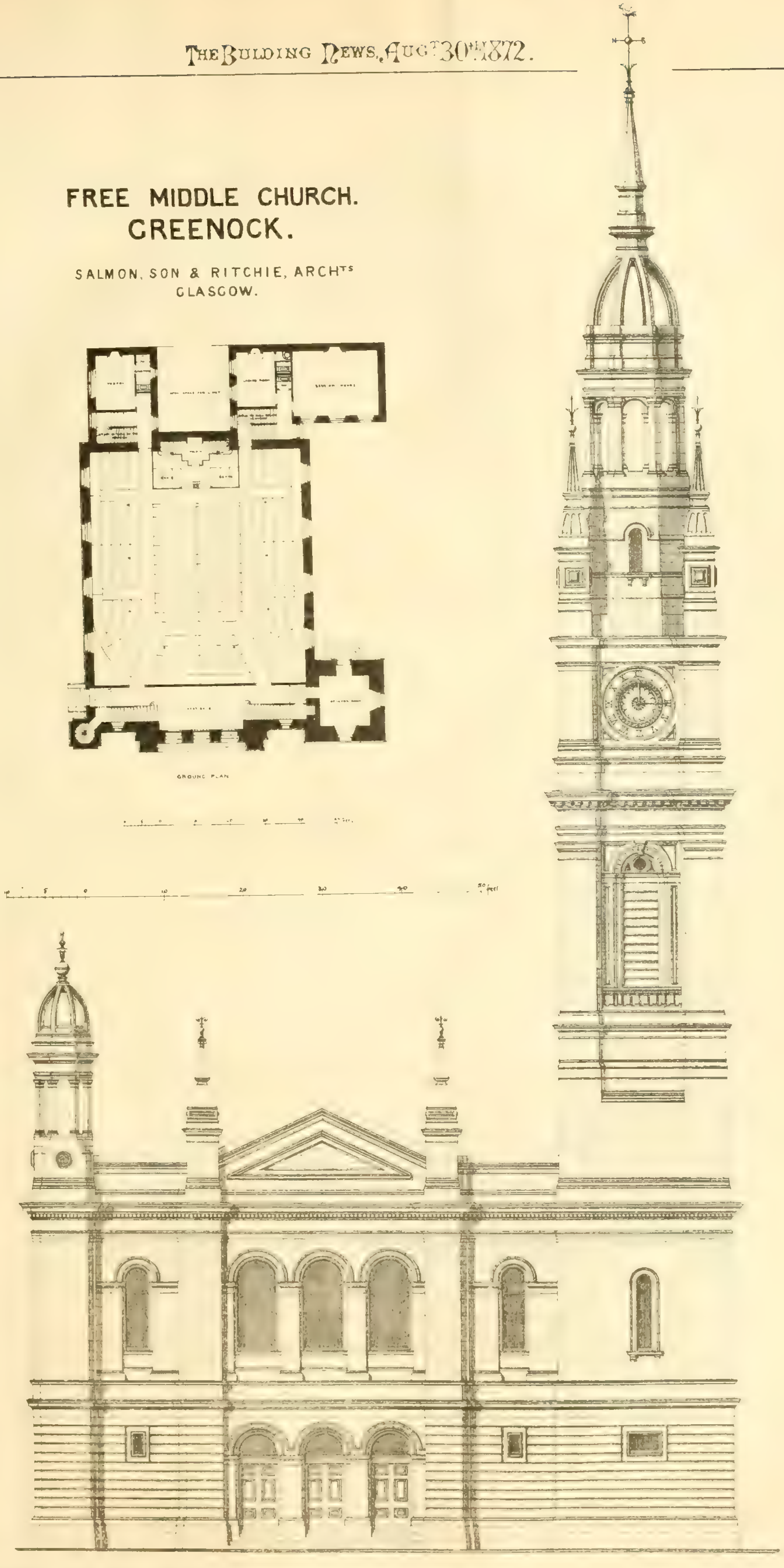
ALL who have examined a tree which has been destroyed by a "thunderbolt" will have noticed not only how the layers of the wood have been shattered and separated into strips, as if full of "wind shakes," but also the dryness, hardness, and brittleness of the wood, as though it had been through the process of curing in a kiln. This is attributed to the instantaneous reduction of the sap—the moisture within the wood—into *steam*. When this moisture is abundant, as in May or early June, the amount and force of the steam not only bursts and separates the layers and fibres, but rends the trunk in pieces or throws off a portion of it, down a line of greatest power or of least resistance. And when the amount of steam thus suddenly generated is less, owing to the drier condition of the stem from continual evaporation and leaf exhalation, there may be no external trace of the lightning stroke; yet the leaves will wither in a few days, showing that the stem has been rendered incapable of conveying supplies, and the tree will either partially or entirely die. Still lighter discharges may be conducted down the moist stem, without any lesion or hurt.



EARLY NORMAN IRON WORK.
WILLINGALE SPAIN CHURCH - SX.

FREE MIDDLE CHURCH.
GREENOCK.

SALMON, SON & RITCHIE, ARCH^TS
GLASGOW.



MODERN ARCHITECTS AND THEIR WORKS.—IV.

THE *Times* has lately pronounced an opinion that all the designs of Mr. Burges and Mr. Edward W. Godwin seem "conceived in the most exclusively and enthusiastically Mediæval spirit." But the reviewer adds that it is a "grave question if the professors of this school have hit on a way of exemplifying their favourite truth which can be tolerated, except by a public of special bent and education." The gravamen of this judgment lies in the word "exclusively." It would not be too much to say that no modern architects are more ready to appreciate the good things of *all* past styles than those just named. But always the precious things they collect from Classic or Renaissance, from East or West, from old tradition or new fact, they pass through their own Gothic crucibles. There is no difficulty in pointing to works which illustrate the truth of this assertion. The Greek theatre in the hands of the one and the common-place suburban house in the hands of the other, are stamped with a character altogether Gothic, but utterly un-Mediæval. This is *not* a distinction without a difference, and the difference can easily be seen by comparing the Harrow Speech-room with the Cardiff Tower, or the Red House at Northampton with the Castle at Dromore. A new tower that forms part of a really Mediæval fortress and a modern mansion built in the west of Ireland with a special view to defence may possibly look so Mediæval as to suggest that unusual form of modern mania which we call enthusiasm. It is a question whether either building will do much good to art, but there can be no question of the harm that would be done were the architect of the one to repeat his tower, or the designer of the other to import his battlements and machicolations to the quiet woods of England. I do not suppose that the one is at all likely, and I am sure the other is impossible. But the great faults to be observed in nearly all the works of these architects are faults quite independent of Mediæval enthusiasm, faults which it may be feared are becoming stubborn for want of pruning. There can be no two opinions that all Mr. Burges's works, no matter in what material they are designed, suffer from a certain coarseness, the result, no doubt, of a wholesome desire to avoid the weaknesses of modern Gothic. But in the constant desire to secure the expression of strength, an over-development takes place, and a character of stunted growth is stamped on every feature. To such an extent, indeed, is this carried that he has almost created a kind of Pollard Gothic where all grace of branch and leaf has been sacrificed to mere trunkiness. Not but what there is much to admire in a pollard, but yet no amount of beauty of spur-form and twisted knot, no quantity of golden lichen, nor mass of variegated moss, will ever compensate for the loss of true healthy growth, or of those proportions which belong to complete natural form. There may be much quaintness in the short bow-legs and long body of the dwarf: we may see a piquancy of effect in a tailless bird, and school ourselves into admiration for the hippopotamus. But there is a higher aim than quaintness, and proportion is not altogether the same as piquancy. This fault of stuntiness is the more remarkable because in sculpture and painting, as applied to architecture, no living architect is a greater purist, or has a greater appreciation of the Greek ideal, and yet, the skeleton of the Dodo clothed in the feathers of the love-bird appears to be his particular weakness. Whether this aim is deliberate, or whether his best thoughts are absorbed by the feathers, and the skeleton is left to others, are questions which it is impossible for me to answer. It is true enough that strength real, and expressed, is an essential if we wish to establish a good school of architecture for the future, but the graceful strength of an Apollo is a very different sort of thing from the bicep force of a blacksmith. The Cardiff tower is as good an example as one could wish of what I have endeavoured to point out as the radical defect in Mr. Burges's work. From ground to finial it is an exhibition of every architectural muscle strained to the utmost, and would be far more appropriately situated on the west coast of Lundy than in a quiet street of a peaceful seaport town. There is no question that its author has knowledge, daring, and even originality, but he lacks refinement and grace, qualities by no means absent from the best works of the early part of the thirteenth century, from which he confessedly takes his *point de départ*.

Mr. Godwin's error is of a different kind: he starts from the same strong faith in Early thirteenth century work, but his vision is as too far-sighted as that of Mr. Burges is too near-sighted; he dwells so long and so hyper-critically on proportion and mass that he has no time left for detail, and thus with one exception all his works suffer from blank spaces. They look, indeed, as if they had been designed with the scissors instead of the pencil, for distant observation rather than for close examination. One would imagine that, feeling disgusted (and not without reason) at the manner in which his first highly decorative work was executed, he had "sworn off," as Rip Van Winkle would say, and was growing cynical towards the sculptor or carver. Be this as it may, I for one cannot help thinking that some of his later works would have been all the better for a little of those ornamental accessories which Mr. Godwin seems to scorn. With these added, and something taken off the solids and given to the voids, considerable gain would be effected. But, while saying this, I am quite conscious that this over attention to mass has been brought about by the excesses committed by other architects in the contrary direction. The excess of weakness in so many modern works has driven Mr. Burges to the opposite extreme of unmeaning strength; the excess of fenestration has driven Mr. Godwin to a Spartan-like severity, which is certainly not in harmony with the spirit of the age. The architecture of the first reminds us of a Doric column reduced to half its lowest height, that of the last of a Corinthian column without its acanthus. We ask the one to be more graceful; we ask the other to be less severe.

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Such are the opinions I have heard retailed in more or less roundabout language. I suppose that I ought not to give an opinion of mine own one way or another. That I should have taken the trouble to write them down may be considered bad taste. Let it be so. There is so much good taste visible everywhere, so much modesty, so much consistency, that I shall not mind the impeachment for the sake of the change. E. W. G.

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ON THE NAMES OF ITALIAN ARTISTS.

By J. B. Waring.

AS many of our readers, in looking over the "Notes on Great Italian Architects," may have been struck with peculiarities as to their names, it may be of use to make some explanations on the subject. To begin—we have nothing in our language corresponding to the various expressions of affection and dislike, of endearing diminutives and unpleasant or ludicrous pleonasms, of the Italians, the delicate shades of which are very numerous, ranging through all the degrees of approval and disapproval.

Besides this, it should be borne in mind that surnames are of late introduction among the Italians, as among ourselves, and these diminutives and expletives are attached to Christian names, by the which and not by surnames artists were generally addressed. Thus the real name of Domenichino, or dear little Domenic, was Domenico Zampieri; and Masaccio, or great ugly Maso (short for Tommaso), was the common title of Tommaso da Castello San Giovanni, or Thomas of Castle San Giovanni, a village near Florence, of whom Vasari says "he received the cognomen of Masaccio, by no means from any vice of disposition, since he was goodness itself, but merely from his excessive negligence and disregard of himself." Again, the surname when occurring is often merely that of the father's Christian name, or the name of the locality whence the person bearing the Christian name was born. A singular instance of the first occurs in Giuliano da San Gallo, whose real name was Giuliano di Francesco di Paolo Giamberti, or Giuliano (the son) of Francesco (the son) of Paolo Giamberti—the surname, Giamberti, being in turn only a corruption of two preceding Christian names belonging to the family—namely, Gian—short for Giovanni, and Berti, a corruption of Roberto; and, finally, he is known by none of these, but by a nickname derived from a convent at which he was employed as architect — that of "San Gallo," outside Florence. It will here be useful to point out that a distinction must be made between "da" and "di," or "del," the first referring to a locality, the others referring to a person. Thus we have Pietro da Cortona, whose proper name was Pietro Berettini, but who was simply known as Peter of Cortona; Leonardo da Vinci, or Leonard of Vinci, an estate belonging to his family in the Val d'Arno; Francesco di Giorgio—Francis (the son) of George; Lorenzo di Piero Vecchietti —or Lorenzo (the son) of Peter Oldpeople; Andrea del Sarto—Andrew (the son) of the Tailor; and Perino del Vaga—or dear little Peter (the pupil) of Vaga, a Florentine painter, whose pupil he was, and who took a special interest in his welfare.

As regards names expressive of feeling and character, we may adduce Giorgione—or, fine handsome George, his proper name being Giorgio Barbaretti Michelozzo (great big Michael); Pisanello — the nice little Pisan.

Other names indicate a place or territory, as Spinello Aretino—or Spinello of Arezzo; Paolo Veronese—Paul the Veronese; Antonio Viniziana—Anthony the Venetian; and Giulio Romano—Julius the Roman.

Many names by which some of the greatest Italian artists are now generally known are nicknames only, such as "Guercino," squint-eyed; "Il Fattore," the farmer (G. F. Penni); "del Tintoretto," the dyer, his father being in that trade; "Il Bronzino," the little brown man; "Il Gobbo," the hunchback (brother of Antonio da San Gallo the younger); "Il Tribolo" (the thistle—teaze or scapegrace); "Il Cronaca," the spinner of yarns; "del Ghirlandaio," from his father the goldsmith, a maker of ornamental garlands for ladies' heads; Sebastian "del Piombo," from the leaden seal which, as clerk of the signet to the Pope, he affixed to official documents.

And whilst some are known familiarly to the world at large by their Christian names only, like the two greatest of all, Raphael and Michael Angelo, others are known solely by the name of their birthplace—*e.g.*, Pordenone, Bassano, Caravaggio, Corregio, and Sansovino, of which latter, it is to be remarked, that it is the proper name of neither of the great artists who are now known by it, the name of the one being Andrea Contucci, of Monte Sansovino in Tuscany, and of the other Jacopo Tatti, who took the name of Sansovino out of love to his master Andrea Contucci, who was usually known as Sansovino only.

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Mr. J. W. Trounson, architect, of Penzance, in sending to the Royal Cornwall Polytechnic Exhibition his competitive design for a church, and his plans for "an attempt to improve the dwellings of the labouring classes," has had the latter highly commended, although, by the rules of the Society, he is not entitled to any mark, having taken their first bronze medal two years ago for architectural drawing.

GOTHIC ARCHITECTURE.—WHAT TO SEE AND HOW TO SEE IT.—BAD ARCHITECTURAL GRAMMAR.—HISTORIC GOTHIC CLASSIFICATION AND NOMENCLATURE. —THE "RESIDUUM" OF ARCHITECTS.

THE following address was delivered by Mr. Edmund Sharpe, M.A., at the opening meeting of the excursion of the Architectural Association on the 19th inst. at Stamford:—

The proper moment for the few remarks that I am about to make would no doubt have been before we commenced our examination this morning of the churches of this town, but our situation on the present occasion is somewhat different from that which we have had before or on former excursions, for we have no single building, no large cathedral or conventicle church to employ our attention for an entire day, the complicated architectural history of which it would be necessary to throw some light upon before you visited it. It appeared to me, therefore, that, workers as we all are, and indisposed even in this our holiday-making to lose any time that might be more profitably occupied, it would be better to devote every moment of daylight to the examination of the churches of Stamford, and to employ the after-dinner hours, when one is more disposed to lounge and to listen, in the delivery of such general observations as I have to make on the group of buildings which are to form the subject of our week's study, and on the lessons they teach us. And this seemed to be the more convenient as it is not our habit, as you know, to indulge in after-dinner speeches, and in personal compliments of the ordinary kind. We are not archæologists in that sense of the word. We expect no mayor and corporation to present us with an address, and we invariably decline the hospitalities which are frequently and kindly offered to us by the clergy and others in the districts that we visit, preferring, in fact, to devote every moment of our time that is not necessary for the ordinary functions of life to the pursuit of our objects.

And here it may not be out of place that I should remind you what those objects are. And first of all let me say what we are not. We are neither archæologists nor antiquarians, in the sense in which those words are usually employed. What we search for and study we do not visit and admire because it is old, but because it is excellent, and on account of its own intrinsic merits. We come to study the history of a great art—the art of building during the Middle Ages. We believe that of all the modes of building of ancient or modern times there is none from which such great lessons in art and in science are to be drawn as that which prevailed during the Middle Ages; none in which the art of carving foliage, or that of moulding and clothing its members with a rich variety of light and shadow, was carried to greater perfection; none in which so much picturesqueness of effect, arising from the variety of sky outline occasioned by pinnacle, turret, parapet, gable, tower, and spire, is to be found; none in which so much knowledge of the power of mechanical science is so strongly evidenced; and in a word, that there is no architecture that the world has yet seen upon which the future architecture of this country is so likely to be engrafted, to take life, and to spring up again into new beauty, as the architecture of our own country as it was practised during the Middle Ages, and which we have this year come to study in its humblest aspect—viz., in the village and parish churches of an agricultural district. When, then, I proposed four years ago this annual excursion to the Architectural Association, it was for the purpose of affording an opportunity, which did not then exist, for the devotion of a week, on the part of any who might be disposed so to employ it, to the study, in company and in rapid succession, of a group of buildings containing a fair selection of the principal characteristics of the different periods of our national architecture; not with a view to supersede, but rather to lead to that careful future examination and record in note and sketch-book which is so essential to the perfect knowledge of the subject; and in the belief that this hasty, preliminary, comparative, consecutive survey of many buildings of varied interest, would be most valuable to the architectural student, as a means of teaching him not only *where* but *how* to study to the best advantage the architecture of his native country, as well as impressing him with broader and more general views than are to be got from the careful but exclusive study of one or two special examples. My impressions in this respect were remarkably confirmed on the conclusion of our Lincolnshire excursion by one of our more talented members, whom I am glad to see present, and who declared to me that he had learnt more of Gothic architecture during the week he had been with us than he had in the course of the whole of his previous professional studies.

Now, in what consists the special advantages which this week's study in common affords to those who take part in it? In the first place, I think it is well for most men to look at things with another person's eyes as well as their own, and a still greater advantage where there are forty pair of eyes instead of one. But that is not all. I daresay that our friend never before had his attention called so closely to those varieties of treatment of detail which distinguish the architecture of one period from that of another, and upon the accurate acquaintance with which all true knowledge in architecture depends.

But is it really necessary, it may be asked, for the production of a clever design for modern purposes that an architect should be so intimately acquainted with all these peculiarities of detail? My answer to that question would be, "Most undoubtedly it is, if you wish your works to live after you, and to do you credit, not otherwise," and I say so for two reasons:—Firstly, because it is as much a barbarism to commit an anachronism in architecture as it is to write bad grammar, or to commit any other similar solecism; and, secondly, because it is utterly impossible for any one to produce a pleasing and harmonious design in any given style of architecture unless he is fully imbued with the spirit and feeling which pervades all the details of that particular style. To unite, for example, in the same design, the mouldings of one period with the carved work of another is not only an offence against good taste and to those who know better, but it is also a breach of the most ordinary rules of art, for nothing is more certain than that the same sentiment and feeling which makes itself apparent in one detail of a building pervades the rest.

Take, for example, the foliage and the mouldings of the Curvilinear period. We find the same sinuous line, the curve of contra-flexure, pervading both the one and the other; just as much, in fact, as the ordinary observer perceives it in its window tracery. So also in the Geometrical period, the circular form of the mouldings is as strongly pronounced as that of its window tracery; and in the Lancet period the elongation of the windows is not more obvious than that of its tall cloistered shafts, its upright stalk-leaved foliage, or its slender mouldings. Now, it was for the purpose of affording opportunities for drawing close attention to and studying their niceties of detail that my proposition was laid before the Committee of the Architectural Association, which has resulted in the establishment of this annual excursion; and I do not think I am mistaken in assuming that the advantages which were expected to be realised from the careful examination in common of so large a number of buildings in rapid succession were not overrated; but that they have been, in fact, realised by those who have taken part in these excursions; and this, I believe, is the true interpretation to be given to the assurance that our friend gave to me at the close of our first excursion, and to which I have just now referred.

But it is obvious that along with finer perceptions as to characteristic treatment of different phases of this noble art—differences of detail which require only to be pointed out to be at once recognised and appreciated, and the knowledge and detection of which increases immensely the interest we take in its study—it is clear that along with advanced knowledge of the true history of this admirable progress comes also the necessity for a minuter classification of its different periods and of fitting terms by which to distinguish them, and here, in fact, we touch on the greater difficulty that the architectural student has to contend with. Not only are the terms which we have employed for the description of our buildings so long as we classed them by centuries inadequate for our present purpose now that we have learned to divide them almost by decades, but there is at this moment the greatest want of unanimity on the part of those who write and speak on this subject in the terms that they employ, nor do they, indeed, always employ the same term when speaking of the same thing.

I will give you two remarkable instances of this want of definiteness on two recent and prominent occasions. On the recent visit of the members of the Architectural Conference to Westminster Abbey Sir Gilbert Scott was good enough to give them a description of the building, and in the course of his description he made use of the following terms as applied to different portions of the works of the abbey. After having noticed the Anglo-Saxon and Norman remains, he spoke of those belonging to the great Transition from Norman to Early English, or rather, he added, from Romanesque to Early Pointed. He next spoke of the Transition from Early Pointed to Middle Pointed, but corrected himself further on by calling the latter the "pure Late Decorated style." He speaks also of Henry III.'s style and of the "Transition from the Middle Pointed to the Perpendicular," and lastly of the "Tudor style" and of that development of it which he recognises as the "Fan-groining" style.

Now, if the "imaginary individual" to whom Sir Gilbert Scott professed to address himself on this occasion, and whom he supposed to be somewhat ignorant of the subject, were really present during the delivery of this address, what remote notion could he possibly form of the nature of the architecture of Westminster Abbey from the terms in which it was thus described? And would not the ten or twelve terms which the learned professor employed for this purpose be likely to confound and to deter him from further approaching a study the very threshold of which is encumbered with technical difficulties of so formidable a kind?

On the other hand we have the President of the Northern Architectural Societies urging that the styles of Gothic architecture should be named "from the centuries, or better still from the king's reigns, because they possess many characteristics not covered by the old definitions." Now, what the death of one king or the coronation of another can possibly have to do with the progress of architecture it is difficult to conceive; nor yet why it should be perceptibly changed at the close of each century. Nevertheless, we find Mr. J. H. Parker realising this idea at the recent meeting of the Archæological Institute at Southampton, by describing the Gothic remains of that neighbourhood as twelfth, thirteenth, fourteenth, or fifteenth century work, varying his descriptions by designating some of it as Edwardian, and as works of the periods of Henry II., Henry III., Henry VII., &c. Were this system to be adopted, we should have no less than fifteen periods, corresponding with so many kings, between the eleventh and sixteenth centuries.

The indefiniteness of the first of these terms—twelfth century work—is obvious when we remember that that period covered the whole of the Norman work of Peterborough Cathedral, which was commenced 1117, the whole of the numerous and remarkable works of the Transitional period, and the choir and eastern transepts of Lincoln Cathedral, its lancet windows and cloistered columns. What possible idea could this term, then, convey to Mr. Parker's hearers at Southampton? To me it seems infinitely more practical and sensible to accept the six great classes into which our national architecture from the Conquest to the Reformation naturally divides itself, and which every one, in his descriptions, has now more or less begun to recognise, and to fix by common and unanimous consent on the terms by which we shall distinguish them. This we have, I think, a right to demand. As regards the selection of these terms, I am, for my own part, quite indifferent; I have, as you know, proposed terms to apply to these six periods, but I have also, as you know, more than once offered to throw them over if better ones can be found, or others to which more universal assent can be obtained. Till these be offered, I shall retain my own as answering the purpose sufficiently well.

It is certainly preferable, if possible, to retain old terms than to adopt new ones; but there are objections to two of the terms already in use, as applied to the new division, which have always appeared to me insuperable. It was in the middle of the twelfth century that the influence which Norman art had exercised for ninety years over architectural design in this country began to decline. The next half century was signalised by that remarkable contest between two rival systems, the Circular and the Pointed, which ended, at the close of the twelfth century, in the supremacy of the Pointed arch in all parts of the building. During the forty-five years of this great Transitional period, more churches were erected in England than at any subsequent period within the same lapse of time. They show great fertility of invention, great vigour and nobility of design, and, in certain parts, great richness of ornamentation; that they were built by native artists there cannot be a doubt, for in the treatment of their details they are, with a single exception (the choir of Canterbury Cathedral), totally unlike the contemporaneous work of other countries; especially of that of Normandy. I claim, then, for the architecture of this period, the importance and originality of which is not even yet sufficiently recognised, the credit, first, of its being the earliest English architecture subsequent to that of the Saxons, that we have; and secondly, of its being the first Pointed architecture that this country ever saw, for the Pointed arch, first introduced into the arches of construction as a measure of utility, and subsequently used into the arches of decoration, prevailed throughout its entire duration. To call any other than this period either Early English or First Pointed is, then, impossible, and to limit the application of these terms to this Early Pointed period, after their long use in another sense, appears to be equally so. What is absolutely certain is that we cannot go on as we are at present—with four systems of nomenclature used by different writers, and two or three used indifferently, as we have seen, by the same writer. How soon we shall arrive at the unanimity in this respect that is so desirable is difficult to say, meanwhile, our course is a simple and an easy one.

You have already recognised the advantages which an intelligible classification and simple and definite terminology bring to the student, and the rapid and suggestive manner in which their use enables you to seize upon and retain the characteristic features of a building, to be utilised hereafter in the same way that the old masters themselves used them, for rely upon it they were students in the same way that we are ourselves. To learn the grammar of their art was as essential to them as it is to us; and there is no reason why you, if you become as thoroughly imbued with the spirit and feeling of the style in which you design as they were, should not be as independent and as original.

It is true that there are some to whom originality is impossible: such men are condemned to copy; they have simply mistaken their calling. They belong to the residuum of which Sir Gilbert Scott speaks in the otherwise excellent address to which I have already referred, and from which I will read an abstract, that, I venture to think, is not inapplicable to the objects of our present meeting, and to those who have attended it, and others, in this and former years. It embodies, at all events, the sentiments which led to the establishment of these annual excursions:—'One valuable means of perfecting our knowledge of architecture is by measuring, sketching, and studying over and over again such buildings as those we have now around us, till we have mastered their principles, and have thoroughly imbued our minds with the character of their detail. If we do this with anything like system we shall do. We ought at least to attempt it. Some of us have done so with more or less success. Unhappily, we cannot afford to be so polite as to shut our eyes to facts. There is a residuum of architects who pay no attention whatever to the cultivation of their artistic powers: who are architects only in name, and whose works are a disgrace to the architectural works of the nation. . . . There is an admirable race of young architects coming up—men not much known, and very little patronised by the public, but men who are following up heart and soul the work which their predecessors have attempted—the revival of Gothic architecture in this country; and whether we are allowed to go on to the natural end of our term, or whether we are to be sacrificed at the behest of newspapers and reviews, I hope it will be to the school of rising architects I have mentioned that our works will be committed, for then we shall have hope for the future."

Mr. Sharpe then passed in review the chief characteristics of the architecture of the valley of the Nene—as embodied in the thirty churches to be visited in the course of the week between Stamford and Northampton—and expressed his acknowledgments, and those of the whole party, to Mr. Matthews, the President of the Architectural Association, and to Messrs. Paice and Clarkson, the Excursion Secretaries, for the admirable manner in which all the necessary arrangements for the lodgings and carriage of the party had been carried out.

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Advance in the Price of Window-glass.—The principal makers of the above material in the Midland districts have issued circulars stating that it is necessary, in consequence of the increase in the cost of fuel and other materials, to advance the price of window-glass. They state that for the present the net price for "fourths" crown will be 42s. per crate; and the quotation for "thirds" 15oz. sheet, glazing quality, is 4½d. per foot, less 25 per cent. discount.

THE SCHOOL BOARDS.

London.—At the meeting of the London School Board, on Wednesday, Mr. Tabrum moved, in the absence of Mr. C. Reed, M.P., the adoption of reports of the Works Committee respecting the acquisition of sites in various parts of the metropolis for the erection of new schools, and for various other purposes. With regard to a site in Cook's-ground, Chelsea, the committee stated that it had been entirely remodelled, and now contained about 25,000 square feet; and that they had entered into negotiations with Mr. G. C. Handford, of 224, King's-road, Chelsea, acting for the rector of Chelsea, for the purchase of the freehold of this site at the sum of £850, subject to a lease of about 52¾ years unexpired, at a ground-rent of £2 per annum, all costs being paid by the Board. They recommended that this purchase should be agreed to. In the case of a site in Greenwich, the committee reported that the sub-division A of Greenwich forms one of a group of eleven sub-divisions, where there is a total deficiency of accommodation for 5,416 children, and where the Board have decided to provide additional accommodation for 4,650 children. The committee had been in negotiation for the purchase, with vacant possession, of a piece of freehold land in Creek-road, Deptford, and containing about 13,600 square feet, from Miss Knott, through Messrs. Paine & Layton, of 47, Gresham House, E.C., for the sum of £950; and they now recommended that an agreement be entered into accordingly, the Board paying all costs, including a sum of ten guineas to the vendor's solicitors for preliminary negotiations. Various recommendations in the reports were approved of. On the motion of Mr. Tabrum, the tender of Mr. W. E. Nightingale, amounting to £5,578, for the erection of a school on a site in Mary-street, Bromley, was accepted. Mr. F. W. Roper and Messrs. Lee Brothers & Pain were appointed architects respectively for schools to be erected in Hunter-street, New North-road, and Gloucester-street, Stepney. The Works Committee were instructed by the Board on the 26th June last to take the necessary steps to invite a competition of four architects for the Board offices to be erected on the Thames Embankment. They now submitted the conditions and particulars which they had agreed upon. The principal of them are:—The competing architects were invited to submit suggestions. An honorarium of 25 guineas will be paid to each of the unsuccessful competitors. Each architect to give the cubical contents in feet of the whole building, measured from the bottom of the foundations to half-way up the roof; the available internal superficial area of each floor, as contained in the rooms; and an estimate of the cost, together with a general specification and description. The Board reserve to themselves the right of rejecting the whole of the designs, should none of them be considered suitable. The plans, drawn to a scale of 8ft. to an inch, to be delivered to the clerk not later than five p.m. on Saturday, the 30th day of November, 1872. The approximate accommodation required for the Board is as follows:—Board-room for forty-eight members, and accommodation for the press, together with a public gallery for about one hundred, with separate entrance; four committee-rooms, two larger and two smaller; an ante-room; rooms for chairman and vice-chairman, capable of being thrown together and used for special committee; a ladies' room, lavatories and water-closets, and hat and cloak room. For the clerk of the Board a private room, a retiring room, an ante-room, and a shorthand writer's room. For the statistical clerk a private room and a room for four clerks. For the accountant clerk a private room, a room for six clerks, a cashier's room, and a large fireproof safe. For the other clerks in general office a large room for works committee clerk, school management committee clerks, industrial schools committee clerk, and space for seven or eight occasional writers. For the school inspectors one room. For the architect a private room, an ante-room, a drawing office and plan-room, an out-door inspectors' room, and a surveyor's room. For the solicitor a private room, and a small clerk's room. In addition, it is proposed to have a general waiting-room, a porter's room, a keeper's room, a keeper's residence made up of four rooms; w.c.'s, and lavatories for all departments, a lift, a cellar for wood, coal, &c., an apparatus room, and rooms for storage of account-books, office paper, &c. The report of the committee was adopted. On the recommendation of the works committee, it was resolved to appoint to the architect's department a chief draughtsman, at £200 a year, six efficient assistant draughtsmen, at a salary not exceeding £120 a year; and a "practical man," at a salary of £2 2s. a week, to take charge of the structural drawings and specifications.

Building Intelligence.

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CHURCHES AND CHAPELS.

Clavering, Essex.—The Congregational Chapel, which was opened last week, consists of the chapel proper, fronting the high road, and several rooms behind required for week-day services, classes, public meetings, and the Sunday school. Facing one on entering, at the farther end of the chapel is the preaching platform, the lower stage for the communion table, and the upper for the minister. It is formed of turned and pierced woodwork, stained and varnished, as is also the whole of the woodwork of the chapel. The galleries surround three sides of the chapel, and are supported on iron columns, coloured and gilt, and the front is framed of wood, fitted in with ornamental iron panels, decorated in colour. Sitting accommodation is thus provided for over 370 people. The principals of the roof are exposed to view, but the common rafters are plastered. During cold weather the building will be warmed by a Gurney's stove sunk under the floor. On each side of the platform is a pointed arch door, that on the right leading to a minister's vestry, and on the left to a large class-room. In the rear of the vestry there is also a scullery, &c., for use at tea meetings, and a separate entrance. Above these rooms is a large room, with an open-timbered roof, for the use of the Sunday scholars, and for public meetings. It is approached by a separate stone staircase from the exterior, and has doors leading into each gallery to enable the children to enter the chapel without going outside the building. The walls of this room are left without any plaster, and have bands of coloured brick worked in as ornament. The building is of Early French character, simply treated. The walls generally are of white Cambridge bricks, relieved by red and black in bands, arches, &c, and by Bath stone and red Mansfield in the tracery of the windows, shafts, bases, &c. The entire cost will be about £1,300. The works have been well carried out by Mr. Cornwell, builder, of Bishop's Stortford, from the designs, and under the superintendence of the architects, Messrs. Sulman & Rhodes, Guildhall Chambers, London.

Folkestone.—The vicar of Folkestone is about to devote a money gift to the erection of a stained glass window in the Lady Chapel in the South Aisle, the subject of which is to be three figures—viz., S. Mary, S. Peter, and S. Michael. The sculptured figures of the Saviour, the Virgin, and S. Mary Eanswyth, which are to be placed over the new porch, are nearly finished. A handsome iron altar screen is being prepared, and other improvements are to follow.

Middlesborough.—The corner stone of a new Unitarian church was laid at Middlesborough on the 14th inst. The style of the building is Early English, with a tower and spire 80ft. high. The church will be built of pressed red brick, with stone facings, and the spire will be wholly built of stone. The roof will be open-timbered, divided into four bays, with large principals. Open oak benches will be provided for 190 persons, and there will be a school in the form of a chancel at one end which will accommodate 100 children, and which, if required, will be thrown into the chapel. The total cost is estimated at £2,200. The plans have been prepared by Mr. Eugene Clephan, and the contractors are Messrs. Shafto & Barry, of York.

Rugby.—On Tuesday week a peal of bells about to be hung in the new tower of the (Roman) Catholic Church at Rugby, were blessed by the Bishop of Birmingham. The bells were cast by Mears, of Wolverhampton. The architect is Mr. Bernard Whelan, of the Adelphi, London. The tower and spire are Early Gothic, rising about 200ft., and are built of Ancaster stone, with ashlar dressings of the same material, much of the sculpture being of Portland stone. The whole of the interior walls, the staircases, bell-chambers, &c., are of finely-dressed stone. The tower consists of three stages, a deeply-recessed doorway, formed by a series of mouldings and marble columns, coming out to the faces of the buttresses; the doors themselves are of best English oak, with floriated hinges of wrought iron, trebly gilt. Above the door is a bas-relief of S. Hubert. On the faces of the lateral buttresses are large figures, representing the Virgin Mary and S. John. They are from the studio of Mr. Pfyffers. The first stage of the tower is vaulted in stone; above it are the ringing and bell-chambers, forming two other stages, and the spire rises above them. The junction of the tower and spire is most artistic. At each angle of the latter rises an elaborate niche of Portland stone, and in these stand carvings of four angels, blowing trumpets; and from the base, in front and beneath, jut out four grotesque monsters. The spire is crocketted to the top, upon which rests a metal gilt cross and crock. A baptistry, built to replace a former insignificant structure, is entirely of ashlar work. The builders were Messrs. Parnell & Son, of Rugby.

Sheffield.—S. Mary's (Roman) Catholic Church, Sheffield, was reopened on Sunday week, after being closed for a fortnight, during which time it has been thoroughly cleansed and painted, under the direction of Messrs. Hadfield & Son, architects. The altar in S. Joseph's Chapel has been completed by the erection of a reredos, consisting of a series of canopied niches, with an arcading at the sides, the full width of the eastern wall, in Caen stone. The architecture is of the early part of the fourteenth century. The central upper niche contains a *relievo* representing the death of S. Joseph, and at each side are figures of the Archangels Gabriel and Michael, while the pediment is crowned with a figure of an angel holding a musical instrument. The design of the reredos is by Mr. Charles Hadfield, and the work has been well executed by Mr. Earp, of Lambeth, the figures being from the studio of Mr. Pfyffers.

Sittingbourne.—The restoration of S. Michael's Church is progressing. The removal of the ugly western gallery, erected in the early part of the century for the accommodation of the singers, has disclosed an extraordinary piece of Vandalism. The capitals and bases of the pillars, which support the ancient Norman arch between the tower and nave of the church, were at the time of the erection of the gallery ruthlessly disfigured to obtain for it a firm support. A new roof to the nave has been commenced. On removing the pews in the north aisle, a discovery interesting to archæologists was made. The workmen came upon the twelve steps which formerly communicated with the rood-loft or gallery believed to have existed in the fifteenth century. The stair is found to occupy the interior of the largest buttress of the north wall.

Southport. — Wesley Chapel, situate at the junction of Aughton-road and Kent-road, Birkdale Park, near Southport, was opened for divine worship on the 22nd inst. by the Rev. Luke H. Wiseman, M.A. (President of the Wesleyan Conference). The style of the chapel is Early English, and is faced on the whole of the exterior with Burnley pitch-faced walling stone. The dressings are executed in Cefn stone. The dimensions are as follow:—Nave, 71ft. 6in. by 44ft.; apse, 20ft. by 20ft.; organ transept, 10ft. by 7ft.; vestry, 16ft. by 14ft.; minister's vestry, 14ft. by 12ft.; principal porch, 12ft. by 11ft.; tower porch, 7ft. by 7ft.; and two vestibules, each 11ft. by 9ft. 6in. Over the front entrance and first bay on the north is a gallery for the scholars and free seats, approached by a separate entrance and stone staircase at the north-eastern extremity of the building. Facing Aughton-road and Kent-road, a tower and spire rise to the height of 110ft. from the ground-line. All the timber inside the chapel is of pitch-pine, and is stained and varnished. The roof is open timber. The pulpit is of pitch-pine, with ebony shafts, carved oak caps and moulded bases, and is neat and effective. The ventilation of the chapel has been well studied by the architects, and the heating apparatus was supplied by Messrs. Whitaker & Constantine, of Bolton, the system being that of hot-air, generated in their patent convoluted stoves, and supplied to the different parts of the building through ornamental iron gratings. The following are the names of the contractors:—Bricklayer, Mr. Lamb; stonemason, Mr. J. Greenwood; joiners, Messrs. Wishart & Irving; slater and plasterer, Mr. Joseph Blanchard; plumber and glazier, Mr. Boyd; painters, Messrs. Cayton & Son. Messrs. Pidduck & Griffiths have supplied the gas-fittings, and Messrs. Boothroyd, Son, & Rimmer the communion table and chairs, and other fittings. The stained glass is by Messrs. Edmundson & Son, of Manchester. The cost of the building and site is about £4,700, which has been entirely defrayed by John Fernley, Esq., of Clairville, Birkdale Park. The whole of the works have been carried out from the designs and under the immediate superintendence of Messrs. Mellor & Sutton, architects, Southport.

BUILDINGS.

Crosland Moor.—The new workhouse at Crosland Moor, Yorkshire, was completed last week. The buildings, which are situated not far distant from the Lockwood railway station, are erected of stone from local quarries. The centre building is 216ft. long and 52ft. broad, and three stories high, and contains the principal entrance and staircase, with central corridors 8ft. wide running from left to right on each floor. In the central tower is a tank capable of containing 10,000 gallons of water, intended to supply all the closets, lavatories, baths, &c. On the right of the principal entrance on the ground floor is the governor's office, and on the left the matron's room. On each side of the staircase rooms are set apart for clothing stores, &c.; the remaining part of this building, on the right hand, is divided into six day rooms for the men, with four staircases to the dormitories, and doors into the airing grounds, making accommodation for 218 inmates. Behind this building, in the centre, is the dining hall, 58ft. long by 35ft. wide, with an open timber roof, and fitted up with desks and seats for 320 persons. To the left of the dining hall is the paid servants' sitting room, kitchens, &c., &c. To the right of the main building is the hospital, a two-storied building, 131ft. long, one-half for males and one-half for females, each with separate entrances. All the sick rooms have windows on three sides, and accommodation is provided for a total of 75 patients. To the left of the main building is the school, 140ft. long, consisting of two day-rooms, two school-rooms, two class-rooms, and sitting-rooms for the teachers, the schools and class-rooms being fitted up with galleries, and lavatories and baths being connected with the day-rooms. The dormitories are on the first floor, two rooms for boys and two for girls. The total number provided for is as follows:—Main building, 218; hospitals, 75; infectious ward, 20; children, 100; total, 413. The buildings have been carried out from the designs of Messrs. J. Kirk & Sons, architects, Huddersfield and Dewsbury, at a cost of £24,000; the contractors being: masons, Messrs. A. Graham & Sons; joiners, Messrs. W. Fawcett & Sons; plasterers, Messrs. T. Longbottom & Sons; plumber, Mr. H. Garton; painter, Mr. G. Brighouse; slaters, Messrs. W. Goodwin & Sons; and ironfounders, Messrs. T. A. Heaps & Co.

London.—Extensive alterations are just now in course of being made in the ancient buildings of the Charterhouse, Goswell-road, especially between the lower end of the Great Hall and the Preacher's Court. The old kitchen, which in its original state had probably served for the same purpose from a date anterior to the dissolution of the monasteries under Henry VIII. down to the present year, has been almost entirely taken down, and is now being rebuilt, and arrangements have been made for the introduction of gas for the purpose of cooking henceforth the dinners of the "Poor Brethren," who, it is almost needless to add, have not been removed with the younger portion of the community into the country. Portions, too, of the wing which was devoted to the servants' residence have been demolished, in order to be rebuilt in keeping with with the rest of the old buildings, only with increased accommodation. A large wall of demarcation has also been built across the gown boys' quadrangle, which severs off completely that portion of the property which has been purchased by the Merchant Taylors' Company for their school, and in which they are already beginning the necessary alterations in order to adapt the place to its new destination.

Northampton.—The new poor schools for girls and infants, erected at Northampton, in connection with the Convent of Notre Dame, Abington-street, were opened on Wednesday week. The building is a two-storied one, its elevation from basement to ridge being nearly forty feet. It is a plain red brick erection, relieved with white brick and stone ornamentation for window arches and sills. The front entrance is also arched in stone, and it is intended to place above it a figure of the Virgin and Child. The dimensions of the two principal rooms are—On the surface floors, 49ft. by 22ft.; height of lower 14ft., and of upper about 18ft.; class-rooms, infants', 22ft. by 12ft., and girls', 22ft. by 19ft. The rooms will afford accommodation for about 300 children. Mr. Hull, S. Giles-street, was the architect, and Mr. Watkin, whose contract of £910 was the accepted one, the builder.

Paddock.—The corner stone of new schools for the Methodist New Connexion, Paddock, was laid on Saturday week. The building will be adjacent to the chapel, and will be Italian in style, accommodation being provided for 700 children. In the basement there will be a spacious kitchen, fitted up with complete tea apparatus, &c. On the ground floor there will be entrances to three staircases on right and left of a wide corridor. On the left hand of the corridor there will be four class-rooms, on the right hand five class-rooms, and at the end a large class-room 36ft. by 20ft. Above these class-rooms there will be a large assembly room to accommodate the whole of the 700 scholars, the dimensions being 80ft. by 36ft. The entire structure will be erected of stone, covered with blue slates, and finished with stucco inside, and is estimated to cost £2,000. Messrs. J. Kirk & Sons, of Huddersfield and Dewsbury, are the architects, and the work has been taken in sections by various local contractors.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Received.—H. B.—W. M.—E. W. G.—E. T.—J. & T. D.—A. G.—G. G. H.—C. B. A.—J. W. C.—W. E. & B.—S. S.—J. McC.—J. A. C.—J. B. W.—J. N.—B. & W.—J. W.—W. B.—An Old Subscriber.—A. P. H.—J. A.—E. W.—J. H. E.—R. T. S.—W. T. B.—E. W. P.—C. A. A.—Sketcher.—Indian Subscriber.—J. T. W.—T. R.—W. P.—S. & Sons.—B. W. & Co.

One of the Premiated.—You do not say our report was incorrect. We would willingly insert an official contradiction.

Correspondence.

LIGHTNING CONDUCTORS.

To the Editor of the Building News.

Sir,—At a time when the public mind is so occupied, as it as at present, on the subject of the importance of establishing a safeguard against lightning, I will, with your permission, offer a few remarks on the subject, and describe a plan which obviates the difficulty; a plan by no means novel, but to which sufficient attention has not been paid, either by architects, builders, or the public generally. Considering with what ease and trifling expense damage by lightning may be rendered impossible, is it not a marvel that all private as well as public buildings are not protected by means of a lightning conductor?

The best form of conductor is constructed of galvanised iron (or, what is still better, though more costly, copper) rope, and is fastened in close contact with the building it is designed to protect. It is continuous in length, and is supported at intervals by skips of the same metal fixed to the building. The upper portion of the rope is fixed to a solid, pointed, copper rod, and electro-gilded at the tip to prevent oxidation. The other end of this rod is fitted with a socket to receive one end of the rope, which is securely and metallically connected to it. As electricity passes over a smooth surface more readily than over one in which breaks occur, the fact of a conductor being continuous throughout its whole length is a valuable feature, as is also the close connection between it and the building, as it thus becomes a safeguard against ascending as well as descending currents. The end of the rope may be either buried in the earth or be terminated in a tank of water, which should be in metallic connection with the earth. It is advisable that each stack of chimneys should have a separate copper rod, which may be connected with the main rope, with which, where practicable, the gutters, &c. round the roof, should also be brought into metallic connection. The advantage to be gained by this is, that as the rod only guards an area in any direction equal to its own height above the height of building it is intended to protect, an extra safeguard is thereby obtained. In cases where it might be considered a disfigurement to carry a rope outside a building, there is no reason whatever why it should not be carried down inside a house. For be it remembered that when lightning has a clear path to the earth, there is no danger to be apprehended; the real danger is when its path is obstructed or its course broken.

It has been suggested that the copper rope should be connected with the water-pipes themselves, and thus save the expense of a rope. This, however, I consider objectionable. If the pipes are made of lead, there is a possibility of the lightning spark fusing them, and thus causing no small inconvenience; while, on the other hand, if they be of iron, the joints indoors are frequently packed with red or white lead, which is liable to destroy the metallic connection.

The cost of the apparatus is very trifling, compared with the advantages it offers: a wire rope of copper of a sectional area of about five-sixteenths or three-eighths of an inch, and about 60ft. long, which is sufficient length for a house of average height, costs only about £3; while a galvanised-iron rope, possessing a sectional area of about $\frac{1}{2}$in., and the same length, costs about a guinea. The finial of $\frac{3}{8}$in. or $\frac{1}{2}$in. copper rod, drawn to a point, and electro-gilded at tip, and about 6ft. long with socket, may be provided for a sum not exceeding half a guinea.

Thus it will be seen that, for a small sum, a perfect safeguard against the disastrous effects of lightning may be provided.—I am, &c., F. RUSSELL.

Electric Telegraph Works, Chippenham Mews,
Harrow-road, August 21.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINS.

SIR,—I understand the principle of Mr. Guillaume's "trough" well enough; it is simply the putting in of an extra syphon-trap with a ventilating pipe. I have, however, objected, and do still object, to this extra syphon-trap at every closet, &c., as a needless expense, and in this I now find Mr. Guillaume himself supporting me, for (p. 152) he says, "In fact, it renders the syphon or other trap comparatively of little value." Now, if his ventilated trough will keep back sewage gas I ask what is to hinder a simple, properly put-in, and properly ventilated syphon-trap from doing the same? More, I respectfully ask Mr. Guillaume to show by a drawing, with explanation, how the addition of his ventilated-trough would have any advantage whatever over a simple syphon-trap put in (say) as shown by Figs. 113 and 118, page 392, May 17, Vol. 22? And as in many cases water-closets are put up in the centre of a building and far from the exterior walls, with soil-pipes dropping perpendicularly down, I ask him to show how he would put the troughs in for them.—I am, &c., PLUMBER.

BETHLEHEM AND BRIDEWELL HOSPITALS SURVEYORSHIP.

SIR,—The election of a surveyor to the hospital estates of the above charities, vacant by the decease of the late Mr. Frederick Marrable, took place on Thursday the 29th inst. There were, as usual, numerous candidates, although the emoluments of the office are not proportionate to the duties expected to be performed by the surveyor. The remedy for this state of things lies with the architects themselves, and it is idle for the profession to expect better terms whilst the foremost men show themselves ready to compete with each other for even the smallest offices, and do not disdain to make use of every petty shift and intrigue to obtain their ends. From those who presented themselves on this occasion, the names of five gentlemen were chosen—viz., Mr. Frederick Porter, Mr. Richard Roberts, Mr. J. T. Christopher, Mr. Charles Barry, and Mr. Trollope. These were still further reduced by striking out the names of those with the least number of votes when Mr. Porter was ultimately elected.—I am, &c., J. H.

DOMES

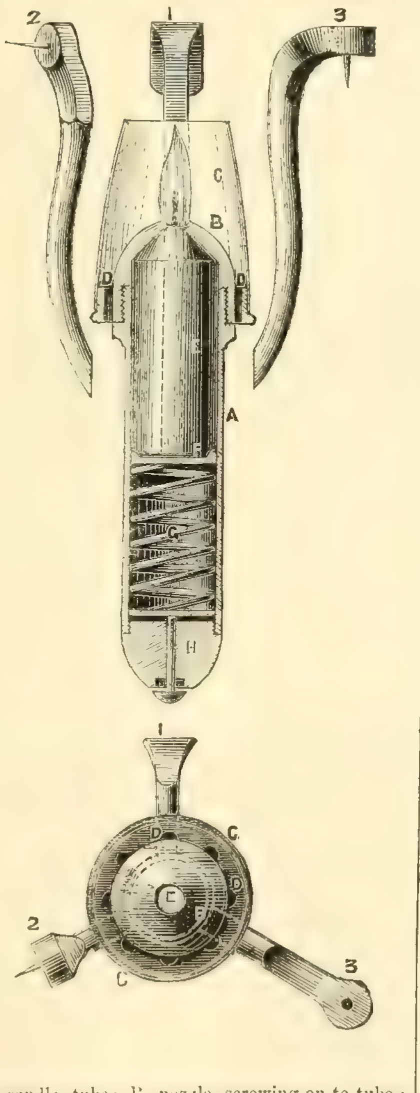
SIR,—Adverting to the leading article in your last week's issue, and to that portion of it on domes as applied to Gothic architecture, I would remind the writer of one—in my opinion—very successful application of the dome to a Gothic edifice: it is that of Bayeux Cathedral, and was introduced during the restoration of that cathedral in 1868. We see that in this instance the architect knew full well that a successful treatment of the dome could not be obtained if the base of it started from the main body of the structure; it is, therefore, led up to by two orders of traceried openings, and is octagonal on plan, with crocketted ribs at each angle, and terminated by a small and graceful spire. Nothing could be more beautiful and effective than the treatment of this, the central feature of the cathedral, and the grouping of it with the pinnacles and spires of the other parts adds immensely to the grandeur of this very grand Norman building.—I am, &c.,

W. W.

SAFETY CANDLE LAMP.

SIR,—In a letter which appeared in your paper some weeks since referring to the lamentable fire at S. Mary Magdalen, Paddington, it was suggested whether some one of your correspondents could not devise means of obviating such accidents for the future.

Many such arise from the custom prevailing among English workmen of carrying their lamp or candle in the hand. Throughout the mines in the Harz Mountains the lamp is attached by a hook to the front of the miner's cap, and accidents by fire are in comparison far fewer than in English mines or upon English works. It is, however, so excessively difficult to persuade English workmen to change traditional customs, that I resolved to design a lamp suitable either for attaching to the cap or buttonhole, or for carrying in the hand. I beg to submit to you a drawing and description of my lamp, trusting you may think it worthy of publication in your paper. I will only add that the safety arms are drawn down very thin where they are rivetted to the candle tube that they may act as springs to prevent any sudden jar from breaking the lamp glass.



A, candle tube; B, nozzle screwing on to tube; C, glass shade; D, draught holes; E, candle; F, sliding socket to receive candle; G, spiral spring; H, bottom plug screwing on to tube; I (^{1}), I (^{2}), I (^{3}), safety arms to protect glass shade rivetted to tube.

This apparatus is similar to a candle lamp with the addition of the glass shade, the safety arms, and the bottom plug. The glass is fixed into the nozzle with whiting. The nozzle is only to be unscrewed when the lamp requires cleaning out. The safety arms protect the lamp from injury through a fall or otherwise.

No. 1 is provided with a hook for fastening to a man's cap or buttonhole. No. 2 has a sharp point to fix lamp to horizontal timber. No. 3 has a similar point to fix lamp to vertical timber. The bottom plug is for introducing fresh candles. A foot may be substituted for the plug.—I am, &c.,

CHARLES TURNER.

12, Tower Ports Hill, Southampton

PLYMOUTH ARCHITECTURE.

SIR,—"Quatrefoil," in your issue of the 23rd, is very hard upon Mr. St. Aubyn and his works in the West—unfairly so, I think. Taking his new churches and restorations in Cornwall and Devon as a whole, we cannot refrain from looking with deep respect and no little admiration upon them. No doubt "A Plymouthian" overshot the mark a little by saying as a retort to "Quatrefoil's" contemptuous condemnation of Mr. St. Aubyn's "very ordinary district churches" that S. James-the-Less promised to be the most striking modern work in the diocese, but this was, of course, to some extent excusable, although two wrongs never make a right. Mr. Hawkins' Church of S. Michael and All Angels at Exeter; Mr. B. Ferrey's S. Michael's at Otterton; Mr. Street's S. John's, Torquay; and Messrs. George and Vaughan's clever little church at Roosdown, with several others, are no doubt superior in many respects, as far as one can honestly judge from the portions of S. James' now built—the plinths are all in and have been for some years, but only a portion of the church has yet been erected. But there is little doubt that Mr. St. Aubyn's churches are immeasurably preferable to those erected by any Plymouth architect; indeed, if I except Mr. Reade's very fair church at Mannamead, I do not remember ever having seen or heard of a new church proceeding from a local architect's office.

"H." is undoubtedly right in his criticisms upon the ugly tops to the small towers upon the west-end of the new Guildhall-buildings, and also in respect to the huge apex stones surmounting the gables, and forming a base for the sculptured figures. Curiously enough, the largest figure over the council chamber stands upon an apex stone of about half the strength of the other ones, although the rest of the figures are not more than two-thirds the size of the one upon the slight base. This is the strangest division of labour I ever met with; it is not "very ordinary," but very extraordinary!

Why does "Quatrefoil" criticise Mr. Keats' new shops in Bedford-street with such undue severity, and gratuitously advise that architect to "stick to his plaster architecture rather than attempt more than he can perform"? If I except Messrs. Ambrose & Snell's new shops in Old Town and Edgcumbe-streets, there are certainly no other mercantile premises to be compared to these in the three towns. Mr. Keats has undoubtedly chosen a free treatment of Italian architecture, but not of a more objectionable description than we see every day turned out by some of our best known architects in all large cities throughout the country. If there were more buildings of the sort in Plymouth the town would be, architecturally speaking, decidedly the gainer for it. "Quatrefoil" ends his first letter by referring to Mr. Norman's new house for Lord Graves in eulogistic terms as likely to be "the finest piece of architectural composition of its kind for many miles around." I hope, and have no doubt it may be, but the formidable notice board at the gates informing the public of the penalties to be incurred for trespassing upon the grounds or building under any pretence, effectually debars ordinary people from having an opportunity afforded them of forming any opinion.—I am, &c., THREE TOWNS.

SIR,—One ordinary "church" does not make 'four,' the number to which Quatrefoil applies that epithet; and I may further add, with regard to S. Paul's, that the building of the tower was a necessity, the site having been given on that condition. As to the question of a clerestory, it was mooted, but abandoned on account of the estimated cost. I think, too, that it is questionable what the effect of a clerestoried nave of about 40ft. long would have been. As to the "utterly useless" east windows, block them up, and see what the result would be. Remember, I have never said that S. Paul's was otherwise than "ordinary." I have only said that with £3,000 it would be difficult to have built a better church. "Quatrefoil," it would seem, has yet to learn how the absence of some accessory or other detracts from the merits of a building. However good a house or church may be in itself, if placed in an open field away from trees or buildings it will lose much of its effect. And such was the position of S. James's Church originally, but "now" bettered by the adjoining "vicarage and schools." Not long ago I saw this fact realised in the case of a church built by Mr. Street, and which never looked well till the schools were added, and which will, doubtless, look better still when the trees are grown up. "Quatrefoil" implies that the S. Mary's Church cost £14,000. I think that half that sum would more than cover every charge connected with it, including the extensive schools in the crypt below it. Doubtless the tower might have been placed anywhere but where it is, but there were utilitarian reasons for its present position, which could not be sacrificed to mere effect. As to his criticisms on it he stands alone, I suspect, for the only adverse one that I have ever heard made was that the pinnacles might have been bolder.

With respect to S. Stephens, "Quatrefoil" betrays somewhat of a Classical prejudice against the freedom of Gothic architecture when he objects to the cutting a doorway through the corner of a window-sill. Had it been done wantonly, it would have been objectionable, but it was a work of a truthful necessity, else the doorways must have cut through buttresses, or placed in a dirty back lane at the west end. As to the tower and spire, *pace* "Quatrefoil," I do not stand alone in pronouncing them good, and, I would add, the best in the towns. I have not the "Ecclesiologist" at hand, but if "Quatrefoil" has, and will refer to its numbers of some twenty-five years back, he will find the churches we have been discussing more favourably noticed than he has done. They were all built in the order that I have named, and each, if I remember aright, was considered in turn superior to its predecessors, consequently the managers of that periodical differed from "Quatrefoil" as to the comparative merits of S. James and S Mary.

As "Quatrefoil" says nothing more concerning Devonport-park Lodge, or the Cornwall-street schools, I need not refer to them, and still less to the house in course of erection for Lord Graves, at Thanckes, on the Cornwall side of the Tamar, which has no more to do with Plymouth than one that is being built by Mr. St. Aubyn for Captain Parker, R.N., at Delamore.

I have not seen Mr. Street's church at Torquay, and I by no means intend to pit Mr. St. Aubyn against him or Sir G. Scott, who was, I think, the architect of Mr. Gibbs' church at Exeter, which I have seen; but if S. James's Church, Plymouth, is completed as it ought to be, I venture to state that it will hold its own with either, and for an unique arrangement to meet the peculiarities of the site will be unsurpassed by any building whatever. The original tender for its erection was £4,000, and for that sum, or thereabouts, had the money been forthcoming, it would have been built, so whatever merits it may possess are those of "architecture" and not "decoration," considering that it will hold 800 persons. An engraving of it long ago appeared in the *Builder*, and also, I think, a plan of the site, an irregular triangle, into which the church fits as a hand into a glove. The arrangement may be briefly described as two naves, with a clerestory on their outer sides only, and two aisles, all four of different lengths, with a tower, vestry, &c.—I am, &c.,

A Plymouthian.

DESIGNS FOR EDINBURGH CATHEDRAL.

Sir,—In the review of the Edinburgh competition, copied from the *Scotsman*, the design marked "Fidelitas" is attributed to me. Will you allow me to assure you that I have no connection with it.—I am, &c.,

W. Burges.

15, Buckingham-street, Strand, August 24.

BERLIN PARLIAMENT HOUSE COMPETITION.

Sir,—From the time I despatched my drawings from London for the above competition I have not directly received a word of information respecting them, no acknowledgment of their receipt, no particulars of the award of prizes, and no notice taken respecting their return to my possession. I should like to know if all the other English competitors have received similar treatment, and if so what course they mean to take. Such treatment, it appears to me, is simply disgraceful.—I am, &c.,

M.

SCHOOL PLANNING COMPETITION.

Sir,—I should feel obliged by your answering the following questions in your next issue. 1. No length given for back wall. 2. It is presumed that a back or private entrance be required to school yards for the purpose of emptying ash-pits, &c. 3. Playgrounds. 4. Will the two class-rooms in the graded schools be required to accommodate collectively 120 children? Will the requirements of the Liverpool Local Buildings Acts suffice? 6. Heating apparatus is mentioned: are ordinary open fireplaces and stoves excluded?—I am, &c,

Liverpool, August 21. A. B. C.

Sir,—In your conditions of the above competition you say that each of the graded schools is to have a general room for the assemblage of the department at one time. Is this merely to be a hall to seat 220 boys or girls? According to the rules issued by the Committee of Council on Education, no more than 120 can well be taught in one graded school, which would necessitate two school-rooms for 220 scholars. Thus, each graded school would have one general room or assemblage-hall, two school-rooms, four class-rooms, &c. Or are we to understand that 120 children are to be taught in the four class-rooms, and the remaining 100 in a school-room, which is to be made large enough to seat the whole 220 scholars when necessary?—I am, &c.,

G. Browne.

Sir,—Is it intended to restrict the competitors in the above to six groups of benches and desks, not exceeding 12ft. in length and three rows in depth for the graded schools? If so I cannot imagine how accommodation can be provided for the 160 scholars remaining in the school-room after the class-rooms are occupied. I should also feel obliged if you will state in your replies whether we may set back the buildings from the streets to any extent we please.—I am, &c.,

X.

Intercommunication.

◆

QUESTIONS.

[2635.]—**Pettenkofer's Process for Restoring Pictures.**—Can any one give me the details of this process?—B. P.

[2636.]—**Kaolin Bricks.**—I believe these bricks possess a remarkably high refractory power. Can any one tell me by whom they are manufactured?—S. R. F.

[2637.]—**Hardening Gypsum Marble or Stucco.**—How is this substance best mixed to obtain the greatest degree of hardness?—Model.

[2638.]—**Barracks.**—Where can I obtain some information (plans, &c.) about the construction of barracks?—M. E.

[2639.]—**Ventilation and Drainage.**—I shall be much obliged if some reader will recommend me to a practical work on the ventilation and drainage of cottage houses.—Country Builder.

[2640.]—**Eynesford Castle, Kent.**—The present remains of this old castle consist merely of a few flint walls, with traces of windows. It is said that Henry II. and S. Thomas à Becket quarrelled about its possession, it being held by the latter, and is in some way connected with the circumstances of his death. Otford, some little distance from Eynesford, was the property of Becket. Can any of your readers tell me something more about the earlier history of Eynesford Castle, and how it has got into its present ruined state? As in other old castles, there are found traces of a moat round its external walls.—J. W. S.

[2641.]—**Estimating Cost of Furnace Chimney Shafts.**—Is there any recognised method of measuring and valuing a lofty brick chimney stack? I have consulted all the books touching upon quantities and estimates, but cannot find any information upon the subject. Is the brickwork taken net according to its exact quantity, or is the chimney measured as if solid, as in the case of an ordinary house flue? Is one uniform price put down for the whole work, or is it priced off in stages to allow for the extra haulage and scaffolding for the higher parts?—R. L. F.

[2642.]—**Estimating Chimney Shafts.**—What is the surveyor's rule for measuring and valuing brick chimneys to furnaces? All authorities on quantities agree that chimneys and flues should be measured as though solid, and that the price of this part of the work should not be decreased in consequence of this artificial mode of measurement; but I imagine that this rule was meant for domestic structures only. I should feel obliged if some of your correspondents would tell me whether I should measure a large furnace chimney stack (say 100ft. high) as solid work; and if so, whether I should price it at the same rate per rod as the walls of the adjoining factory. Also, whether there is any rule for increasing the price of the work for the higher stages of the chimney to compensate for extra height of scaffold at top, and consequently extra thickness of same at bottom, and for the increased labour of hoisting the materials.—R. M.

REPLIES.

[2626.]—**Kitchen Boilers.**—"J. T. J." (p. 112) says that every evening about seven o'clock a disagreeable noise arises from the kitchen boiler, or from the pipes in connection with it. Now, seven p.m. will, I suppose, be just after dinner, when a large fire being on, the water in boiler begins to boil, and the steam therefore gets up, and owing to it possibly not getting away so readily as it ought to, the noise complained of begins. This noise may be caused by the top coupling of boiler projecting down into boiler, or by the end of boiler where coupling is being lowest. Now these should be guarded against. The end of boiler where coupling is should rather be highest, and if the coupling projects into boiler it should be taken out and the projecting part either cut off, or else two slits cut in it with the file. The top or hot pipe should also have a regular incline all the way between boiler and tank, and not be allowed to "bag" down anywhere.—P.

[2627.]—**Template and Templet.**—"The best way is to make a templet to the well-hole of the stairs, as the shadowed part in the plan B, then draw the rise and thread of the steps on the templet as C."—Page 53, plate 34, in work by William Pain, A.D. 1771.—M. G.

[2627.]—**Template and Templet.**—I believe template to be a corruption of templet. A templet has two meanings:—1. An instrument for taking the length of the stretcher and the width of the header in building walls, &c. 2. A wooden mould used by masons and bricklayers for sloping, battering, and curved work.—J. T. J.

[2627.]—**Template and Templet.**—I quote from an author under date 1703. After referring to the London Act of that date, he says: "Thus far the Act. Note further. When you lay any timber on brickwork, as tassels (or torsels) for mantle-trees to lie on, or lintels over windows, or templets under girders, or any other timbers, lay them in loam, which is a great preserver of timber, for mortar eats and corrodes the timber."—P. 172. "Again, some also advise that all tarsels for mantle-trees to lie on, or lintels over windows, or templets under girders, or any other timber that must lie in the wall, to lay them in loam, which is a great preserver of timber."—P. 72.—M. G.

WATER SUPPLY AND SANITARY MATTERS.

Andover.—It appears from a report by Dr. Thorne Thorne, on an outbreak of diphtheria in the town of Andover in Hampshire, that the inhabitants, numbering nearly six thousand, are dependent for their water-supply on wells, many of which are sunk into the chalk in dangerous proximity to sources of excremental pollution. Both the chemical and the microscopical examination of some of these waters show undoubted pollution. The report of Dr. Burdon Sanderson cannot, the *British Medical Journal* thinks, be a pleasant morsel to the inhabitants. The water, he says, contains monads and amœbæ; it also swarms with bacteria. The fact that it contains bacteria in such numbers proves that it contains organic matter in a state of active putrefactive decomposition, and that it is wholly unfit for human consumption. An efficient system of drainage is also much needed.

Hornsey.—From some correspondence read, and the discussion which ensued, at a recent meeting of the Hornsey Local Board, it seems that the Seven Sisters Road, from the principal entrance to Finsbury-park to the corner of Blackstock-lane, is without sewerage of any kind, the whole of the surface water passing into some adjacent fields, finding its level at the back of houses, and causing in wet and stormy weather a fearful nuisance. There is a dispute between the Hornsey and the South Hornsey Boards as to which Board the road belongs to, and while this point is unsettled the public suffers.

Liverpool.—At the meeting of the Liverpool Water Committee on Monday, a discussion took place upon the water supply of the town. The chairman of the committee stated that a number of deep wells, from which a large proportion of the town water had been drawn, had of late years become contaminated by sewage, which had dangerously affected the purity of the water, but in some cases the measures taken had remedied the evil. With regard to the main reservoirs at Rivington, these works were designed 25 years ago, since which time Liverpool had nearly doubled its population, so that some measures would have to be taken to increase the supply. A new reservoir was being constructed at Rivington, and would be ready in 18 months hence, and he (the chairman) was satisfied that with that addition, if they could restore the wells to their original state of purity, there would be sufficient water for ten years to come. This course would entail a large expenditure, but it was for the inhabitants to say whether they would adopt this, or force the Corporation to adopt a scheme like that of bringing the water from Bala Lake, at an outlay of a million or a million and a half. At present there was a positive want of two million gallons a day on a ten hours' supply, and he believed that there was something like £30,000 or £40,000 worth of water absolutely wasted every year. The committee had visited Manchester, and ascertained the system in force there for checking leakage and waste, and they considered it to be very effective and complete. A discussion ensued, in the course of which it was stated that though the reservoirs at Rivington were at present full to overflowing, Liverpool was on a supply of only seven hours daily. It was ultimately agreed that an amended code of regulations and instructions to the public as to the prevention of waste should be drawn up and submitted to the next meeting.

S. George's, Hanover-square.—The Vestry of S. George's, Hanover-square, have rejected the recommendation of a committee that the Medical Officer of Health for the parish shall not be allowed to carry on a private practice. They have, however, approved of the salary being fixed at £350 per annum, as proposed by the same committee. The appointment (which is vacant by the death of Dr. Aldis) will not be made until after the recess.

The Pollution of Streams.—Some experiments have been tried at the cloth mills of Messrs. Thomas Pratt & Sons, Leeds, with an invention of Mr. Fulda, of Ramsgate, for the clarification of impure and discoloured water. The tank into which all the discoloured water from the mill is conducted holds about 10,000 gallons, the daily discharge from the works. Mr. Fulda, with the limited apparatus he has at command, purifies the 10,000 gallons in two hours. After leaving the storage tank, the refuse from the mill passes through a two-inch pipe into a well. Here it is simply churned by an agitator driven by a two-horse power engine, whilst from a cistern chemical ingredients (the nature of which constitute part of Mr. Fulda's invention) are mixed with the refuse. The result is surprising. Discharged from the well into another storage tank, the dye water may be seen in process of filtration—the thick, murky dye material settling to the bottom of the tank. The water, relieved of the coloured matter, passes into another tank, and thence leaves the works apparently as bright and clear as when it entered. In dealing with the chemical refuse of a cloth mill, Mr. Fulda labours under great disadvantages, combating as he does with matter foreign to sewage. In the case of sewage, he avers that, after passing through one precipitating pan under his system, the water is capable of human consumption. He also claims for his invention cheapness, simplicity, efficacy, and expedition.

The Well at the New Lambeth Workhouse.—Mr. Parris, the architect for the new workhouse now in course of erection in Lambeth, states that the artesian well has been bored through 100ft. of chalk, but that the well at Bethlehem Hospital is still 30ft. lower. It has been decided, on the recommendation of the architect, that the well shall be carried 50ft. lower, so as to be below the well at the hospital. This will make the well 150ft. below the surface, which is unusual for wells of this description, 100ft. being considered an average depth.

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STATUES, MEMORIALS, &c.

Bust of Sir Walter Scott for S. Louis, Missouri.—Mr. John Hutchison, R.S.A., of Edinburgh, has just completed a bust of Sir Walter Scott, for S. Louis, Missouri. The work was commissioned by the Caledonian Society, a body of patriotic Scotchmen in S. Louis, and is intended to be placed in the public library of the town as a permanent memorial of the Scott centenary celebration. In carrying out the task assigned him, Mr. Hutchison had at his disposal the model of a bust by Chantrey, as also the fine portrait of Sir Walter by Colvin Smith, R.A., which was exhibited in the Scott collection last year. The result comes out in fine Carrara marble, draped in the folds of a plaid secured over the left breast with a simple Celtic brooch.

Patna.—A new drinking fountain was opened at Patna, near Liverpool, on Monday week. It consists of a basement of polished gray Aberdeen granite, with two basins, into which the water flows through two metal spouts issuing from lions' heads. Above is a moulded plinth of Yorkshire stone supporting the shaft of the fountain, which is of polished Aberdeen granite, with a moulded band across the middle, with a carved shield, and arms a lion rampant. Above the shaft is a richly-carved Gothic capital, with splayed angles, surmounted by an open corona in Yorkshire stone, carrying a carved conventional *fleur-de-lis*. The total height of the fountain is twelve feet from the basement to the top of the finial. The design was furnished by Mr. H. H. Vale, F.R.I.B.A., architect, Liverpool.

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Our Office Table.

The London and North Western Railway Company have commenced surveys for a line from Seaton to Kings Cliffe. The Midland Railway Company have been surveying for a new line from Kettering to Weldon, Kings Cliffe, and Stamford.

One-class Railway Trains.—At the last half-yearly meeting of the Blyth and Tyne Railway Company, the chairman, Mr. Joseph Laycock, said he had had some serious thoughts of adopting the American system of having one class of carriages only, for at present they found considerable difficulty in appropriating their various carriages to their promiscuous traffic. They had some carriages running empty, while others were overcrowded, and he thought, on a short line like theirs, it would be no hardship to run nothing but third-class carriages. The fact was that they had a very large proportion of third-class passengers as compared with others; for instance, their first-class passengers numbered 19,000, while of third-class passengers they carried 577,000 during the half-year. He repeated, on a short line like theirs, he did not see how it could be a hardship for respectable people to ride third-class, and in fact, owing to the great accommodation first-class passengers expected to receive, they became a regular nuisance.

Prince Consort's Statues.—The *Pall Mall Gazette* says:—"Some unfortunate fatality seems to attach itself to the Prince Consort's statues connected with the memorials erected to him. In the Hyde-park memorial the absence, "from unavoidable causes," of the principal figure has led many persons to mistake the pedestal for a sarcophagus. In Dublin, from unavoidable causes, the statue of the Prince was not forthcoming when it was to have been inaugurated, and as the pedestal was also wanting, a sham figure was placed on a sham pedestal, which shortly afterwards was damaged by a sham explosion. In Edinburgh the Queen, who was to have inspected the equestrian statue of the Prince which the people of Scotland intend to erect to his memory, was prevented from doing so by the fact that the statue is not yet ready, so that all that her Majesty could do was to drive through Charlotte-square, where it is intended that the memorial shall in course of time be placed."

Raphael's Marble Group.—The *Nordische Presse* announces, "under reserve," that there has lately been discovered at S. Petersburg the only work of sculpture by the hand of Raphael, consisting of a group in marble, representing a child reposing on a dolphin. Models in plaster and engravings of the group are well known, but the original, the existence of which at Paris about the year 1770 is incontestably proved, has disappeared since then, and it is not improbable, says the *Presse*, that the group which has been found, among other objects of art bought in the time of the Empress Catherine II. to adorn the Palace of the Taurida, is really the original by the chisel of Raphael.

Transferring Pencil Drawing on Paper to other Paper.—Any kind of reasonably fine paper, either thick or thin, serves to receive the copy. Simply lay it upon the drawing board, then upon the face of the drawing paper lay the transfer paper, and upon the top of the lot lay the drawing, pencil marks upwards, fasten the whole three sheets together, and to the board, by four drawing pins, one at each corner, then proceed to run over the pencil marks with a fine but dull pointed instrument. Use for the purpose a stocking darning needle with a handle, and the point ground off; run over the marks in the same way as with a transparent slate. If the drawing is not too thick, and the carbon paper good, a good copy with care and practice may be obtained. Copies are also taken by first perforating the picture with small holes along the marked lines with a needle, then afterwards laying it on the face of another sheet of paper, and rubbing it over with powdered black lead; the black lead goes through the holes and leaves a dotted outline beneath. A pencil is afterwards run over the marks, and a fair copy is produced, which can be quickly multiplied.

Leeds School of Art.—The following students of the Leeds School of Art have been awarded third grade prizes by the Science and Art Department. Advanced prizes have been awarded to Miss A. J. Addyman, for painting a group from nature in water-colours; G. B. Bulmer, for a design for surface decoration; Thomas Hunt, for a drawing of the figure from the cast; J. C. Lancaster, for a drawing of the figure from the cast; Samuel Sibbett, for a drawing of the figure from the cast; Alfred Walker, for a design for plastic decoration; Wm. Webb, for a design for surface decoration; Miss E. Pegler, for painting a group from nature in oil-colours; G. H. Oliphant, for a model of the figure from the cast; A. Corkwell, for a shaded drawing from the cast; F. Horsman, for a shaded drawing from the cast. Elementary prize has been awarded to William Hall, for a drawing of details of architecture from copy.

Tramway Cleansing Machine.—A new machine, designed to simplify the process of cleansing the tramway rails, has just been invented and patented by Dr. Alexander Wood. A trial of the machine was made on Monday at Edinburgh. The apparatus (which requires a horse and man to work it) consists, in the first place, of a couple of metal pickers, which fall to the bottom of the grooves in the rails; and to guard against the snapping of the picker, on encountering stones or other obstacles, it is hinged and kept in position by a spring, the strength of which is calculated to overcome minor obstructions, but when an extraordinary obstruction is encountered, the picker bends back, and in doing so rings a bell, which warns the driver, who can dismount from the vehicle and remove the stone or whatever else happens to be in the way.

Water-Stopping Efficiency of Substances.—Mr. J. Smyth, M.A., read a paper last week before the British Association on an apparatus for testing the water-stopping efficiency of clays, soils, and other substances. When engaged in 1867 in repairing a leak in the principal embankment of the Basin Reservoir, he was obliged to make experiments on the capabilities of peat clays and soils in staunching water, and felt the want of an efficient apparatus for the purpose. Subsequently he was led to devise an apparatus, consisting of a cylindrical chamber, 6in. in diameter and 3ft. deep, provided at the bottom with a perforated plate which allowed all leakage to pass away. At the top there was another plate, into which was screwed a one-inch iron pipe, made of such length as the position of the instrument and the pressure desired to be experimented with warranted. Two narrow glass windows, 2ft. long by ½in. wide, were provided on opposite sides of the cylinder, from which the behaviour of the substances under experiment might be observed.

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An offer has been made by the General Sewage and Manure Company (Dr. Anderson's process) to the Corporation of Coventry to take the sewage of the town for a period of fourteen years, the town to be put to no expense in the matter, the whole cost of the erection of works, &c., being borne by the company.

CHIPS.

A new Methodist Chapel was opened at Birkdale, Lancashire, on Thursday week. The style is Early English, and the building, which has cost £4,000, will seat 700 persons. Messrs. Mellor & Sutton, of Southport, are the architects.

The new Parochial Institution, George-street, for the parish church of S. Mark's, North Audley-street, is being constructed from designs by Mr. Withers, architect. It will comprise industrial and soup kitchens, workmen's club, mission-room, parish and committee rooms, model lodgings for parish officers, art school, &c. The front next George-street will be of red bricks, and will be six storeys high. Messrs. M. Allen & Son have the contract for £4,413.

The Committee of Works of the S. George's, Hanover-square, Vestry having decided to use the steam roller in Albemarle-street, one of the residents wrote to say that the roof of his cellar was damaged by the roller, and asked for compensation. It appears that the "damage" was the fall of some cement from the roof of the cellar. The committee have decided to advise the Vestry to repudiate its liability, an opinion being expressed that the cellars ought to be built strongly enough to bear any weight that might pass over them, and that, moreover, the owners ought to keep them in proper repair.

The French Academy of the Fine Arts has nominated M. Cavalcaselle, of Venice, to be foreign correspondent, in place of M. Polili, deceased.

In the district of S. George's, Hanover-square, complaints have been made that the men with the watering carts have driven close to the kerb and thus watered the footways in front of certain shops, for which they received a gratuity.

The foundation stone of a new Wesleyan Chapel was laid at Hanham, near Bristol, on Monday. Mr. G. Painter, of Hanham, is the builder. The cost will be £1,200, and the chapel is to accommodate 450 persons.

The Baptist Chapel at Hanham, near Bristol, was reopened on Sunday, after restoration.

Mr. J. A. Kirkey has been appointed, after competitive examination, County Surveyor of Longford.

On Thursday week, during the progress of excavation at White House policies, Kirkcaldy, for the erection of an Independent Church, the workmen came upon two large stone coffins, in a fair state of preservation. A few days previous two coffins had been discovered, as also an urn.

On Saturday last the men in the employ of Messrs. G. Porter & Co., sculptors, of Bath and Bristol, had their annual outing at Weston.

On Friday week the parish church of Eastchurch was reopened after restoration, both of chancel and nave, according to the plans of E. J. Tarver, Esq., at a total cost of £1,000.

Mr. E. W. Godwin, F.S.A., is erecting a picturesque half-timbered residence for the Earl Cowper, K.G., at Beauvale, Nottinghamshire.

Mr. Holman Hunt, who has been several years in Palestine painting his new picture, has returned to England lately, and has been visiting his old friends.

A biography of the late David Cox will shortly be published by Messrs. Chapman & Hall. The author is a resident in South Staffordshire, well-known for his attainments in art.

Two pupils of the Cork School of Design have been selected by the Science and Art Department for employment in copying the Raphael cartoons. It is proposed to employ nine artists in this work.

Messrs. Shearer, Smith, & Co., of the Dalbeattie Granite Quarries, having lately completed the supply of worked granite for the great Basses Lighthouse, have been entrusted with the supply of the worked material for the sister lighthouse about to be erected on the Little Basses Rocks.

By an Act of Parliament just printed, the Public Works Loan Commissioners are authorised to make advances to School Boards, in pursuance of the Elementary Education Act, 1870. Power is given to issue £1,000,000 out of the Consolidated Fund for the purpose mentioned.

Mr. J. Talbot Clifton has presented a park of several acres in extent to the inhabitants of Lytham.

The oldest artesian well in Europe is said to be that at Lilliers, in the Pas de Calais, France, and from its mouth water has flowed uninterruptedly for 746 years.

Sir Richard Wallace has, it is stated, made an offer to defray all expenses incurred in the forwarding of English objects of art to the Vienna Exhibition.

The Bradford Corporation, who already hold two spacious parks, have just purchased land with the intention of forming a third park of thirty acres. Two other parks, making five in all, are to be formed immediately.

A memorial window has been erected in the north west corner of Dunfermline Abbey, in memory of the late Mr. and Mrs. Hunt, of Pittencrieff. The window architecturally belongs to the Early Pointed style, and is divided into three upright compartments by thick stone mullions.

Trade News.

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WAGES MOVEMENT.

London.—The strike has virtually ended, and the terms of compromise agreed on are as nearly as possible those suggested in the Building News at the commencement of the dispute. The concessions obtained by the men are embodied in the following memorandum: — "2, Westminster Chambers, 28th August, 1872. At a Conference between the Sub-committee of the Master Builders' Association and a deputation from the Amalgamated Trades' Committee, representing the plasterers, painters, metal workers, and labourers, the following arrangements have been agreed to. The working hours in the shops to be 52½ all the year round; and 52½ hours per week for forty weeks in the summer, and 48 hours per week for outdoor works in winter, leaving off at 1 o'clock on Saturdays in the winter weeks. The wages of all trades represented, and the labourers, to be raised one half-penny per hour above the present rates. The overtime beyond the above hours, when working at the request of the employer, to be paid for at the following rates—viz., for the first hour one penny extra for mechanics, and one half-penny extra for labourers. From the end of the first extra hour up to 8 p.m., at the rate of twopence extra for mechanics, and one penny extra for labourers. After these hours at the rate of time and a half for mechanics and labourers alike. The extra time on Saturdays to be paid for at the rate of time and a quarter up to 5 o'clock, and after that time at the rate of time and a half. This scale not to apply to the case of men working overtime at their own request, or to make up time lost by them during the week." It is more than likely the bricklayers will shortly see their way to coming to an agreement with the employers, and the whole strike, therefore, which commenced on the 1st of June, may be said to be virtually at an end. To render the foregoing memorandum fully intelligible, it may be stated that the wages of plasterers have hitherto been 8d. the hour; painters, 7½d.; metal workers, 8d.; and labeurers, 5d. The compromises will be generally accepted as both liberal and equitable. Half the money demanded by the carpenters and joiners is conceded. Four of the 5½ hours asked for are surrendered by the employers to in-door hands, who will receive all the year round £1 17s. 2¼d. for a working week of 55½ hours, instead of £1 17s. 8d. for 56½ hours. Out-door time and pay will be the same for 40 weeks of the year, and for the remaining twelve 48 hours at £1 14s. The demand for overtime was 1s. 0½d. for the first two hours, and 1s. 5d. afterwards; the concession is 10d. and 1s. 0¾d. On Saturday 1s. 5d. was the requisition. Up to 5 o'clock the pay will be at the rate of 1s. 2d., and the eighth of a farthing; and all subsequent hours 1s. 5d. At a meeting of the carpenters and joiners on Wednesday the following resolution was agreed to:—"That we, the delegates here assembled, after hearing the report of the deputation elected to confer with the Master Builders' Association, do hereby agree to resume work at once on the terms agreed upon with the Master Builders' Association. At the same time, we recommend the continuation of this organisation, with a view of obtaining terms more satisfactory to the trade at the earliest opportunity. And also for the purpose of establishing the present terms throughout the trade of London." The following was also agreed to:—"1. That after Monday, the 2nd of September, two of the committee do sit, in conjunction with the secretary and treasurer, to transact all business up to the next delegate meeting, and that all men now signing at the various districts and not obtaining jobs by Tuesday, the 3rd, will sign at the Brown Bear after that date. 2. That the meetings be adjourned until this day (Thursday) week, to receive reports of how the terms are being adopted; and 3. That a levy of 3s. per man be made on Saturday." The general committee of the Master Builders' Association met yesterday afternoon to ratify what the subcommittee has done in effecting the final settlement of the dispute.

Wishaw.—The Wishaw quarrymen having lately made a demand for an additional 1d. per hour on their wages, and no satisfactory answer having been received, have struck.

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BANKRUPTS.

DECLARATION OF DIVIDEND.

H. Field, Sandy, Beds, builder and ironmonger, div. 2s. 4d.

PARTNERSHIPS DISSOLVED.

Norbury & Shaw, Salford, engineers.—Welland & Bucknall, S. Thomas the Apostle, Devon, timber merchants.—W. T. E Hand and W. F. Dury, Leeds, iron masters.—Hutchinson & Scholes, Elton, near Bury, painters and paperhangers.—Britannia Engineering Company, Bolton, engineers.—Holgate & Brown, Leeds plasterers.

TENDERS.

Blackburn.—For extending the Free Library and Museum now in course of erection at Blackburn. Messrs. Woodzell & Collcutt, architects:—

Marshall & Dent (accepted)	£766

Blunsdon S. Leonard's.—For the erection of new school buildings at Blunsdon S. Leonard's, near Swindon, Wilts, for the Rev. W. H. Roach. Mr. William Clissold, architect:—

Harper & Son (accepted)	£335

Bromley.—For the erection of manufacturing premises at Bromley. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Sheffield	£3575
Grover	3375
Aldous	3226
Atherton & Latta	3200
Gregan	3195
Abraham	3175
Alexander	3130
Wicks, Bangs, & Co. (accepted)	2990

East Sheen.—For building new stable, for Mr. R. W. Willis. Mr. E. Ingress Bell, architect. Quantities supplied:—

Stimpson & Co.	£698
Hibbins & Trasler	691
Sharpington & Cole	653
Gibbs	630

Essex.—For the erection of a new farmhouse and stabling at Twinstead, Essex:—

Rogers	£1150	11	8
Grimwood & Sons	1140	0	0
Hawkins	907	0	0

Ireland.—For the enlargement of hotel building at Rosstrevor, County Down, for Mr. W. Sanxter. Mr. W. James Watson, C.E., architect:—

McQuirk	£510
Rantin	487
McShane & Lavery	480
Wheelan (accepted)	454

Ireland.—For new Wesleyan Manse at Newry, County Down. Mr. W. James Watson, C.E., architect:—

McShane & Lavery	£690
O'Hare	675
McQuirk	640
Wheelan	600
Rantin (accepted)	539

Ireland.—For carrying out alterations, and erecting new offices, at the Newry Salt Works, County Down, for Charles Lampey, Esq. (exclusive of fittings). Mr. W. James Watson, C.E., architect:—

Wheelan (accepted)	£730

Ireland.—For the enlargement of corn-store at Newry, County Down, for A. R. Walker, Esq. Mr. W. James Watson, C.E., architect:—

Wheelan	£530
O'Hare	475

Ireland.—For erecting a single-story cottage at Rosstrevor, County Down, for Edward Greer, Esq. (exclusive of ironmongery and fittings):—

Wheelan	£400
Rantin (accepted)	306

Ireland.—For alterations to a house at Portadown, County Armagh, for Richmond Pepper, Esq. Mr. W. Jas. Watson, C.E., architect:—

Collen Brothers (accepted)	£161

Ireland.—For alterations to a house at Rosstrevor, County Down, for Edward Greer, Esq. Mr. W. James Watson, C.E., architect:—

Rantin	£264
Wheelan (accepted)	234

Ireland.—For erecting new offices for the directors of the Newry Gas Consumers' Company, Newry, County Down (exclusive of ironmongery and fittings). Mr. W. James Watson, C.E., architect:—

Wheelan	£372
Rantin	368
McShane & Lavery (accepted)	349

Ireland.—For the erection of four new houses, which are to form the first portion of a new terrace at Rosstrevor, County Down (exclusive of fittings and ironmongery), for Edward Greer, Esq. Mr. W. Jas. Watson, C.E. architect:—

McShane & Lavery	£1801	12	0
O'Hare	1675	0	0
Rantin	1576	0	0
Wheelan (accepted)	1550	0	0

Middlesbrough.—For the erection of Roman Catholic Schools, Middlesbrough. Messrs. Hunter & Carr, architects. Quantities supplied:—

Hallgate (accepted)	£1193	10	0

Ponder's-End.—For the erection of eleven cottages for the London Jute Works, Ponder's-end. Messrs. Kennard & Buck, Finsbury-circus, E.C., architects:—

Hunt	£1974
Cowper	1740
Clark	1700
Tarrant	1528
Rist & Brown	1525
Field & Son	1480
Crook & Wall	1470
Crook & Wall (concrete)	1370
Norman	1265

S. Leonard's-on-Sea.—For making new roads and drains on the Eversfield Estate, S. Leonard's-on-Sea. Messrs. Fowler & Hill, architects, S. Leonard's:—

Hughes	£1029	10	0
King (accepted)	835	0	0

Sittingbourne.—For new banking premises at Sittingbourne, Kent, for the London and County Banking Company. Mr. C. Jocelyn Parnell, architect. Quantities by Mr. James Schofield:—

Seager	£3335
Beaumont	3329
Cooke & Green	3116
Hill & Son	3081

Stratford.—For cottages and offices in Meeson Wharf-road. Messrs. Hills & Fletcher, architects. Quantities supplied:—Gregar £480

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COMPETITIONS OPEN.

City of London, September 5.—For designs and tenders for the execution of a medal, to be struck as a memorial of the late National Demonstration on the visit of Her Majesty to the City on the Thanksgiving Day.—Woodthorpe, Guildhall.

Devizes, October 9.—For designs and estimates for an Odd Fellows' Hall and Institute.—Mr. W. H. Hill, The Green, Devizes.

Grays Thurrock (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

Kingswinford School Board, October 1.—For a design for school buildings to accommodate 800 children, with class-rooms, master's and mistress's houses. Premiums of £10 for the best and £5 for the second best designs.—Mr. J. L. Holberton, Clerk to the Board, High-street, Brierley Hill.

Oban, September 12.—For designs for a new church. A premium of £25 will be given for the most suitable design.—Mr. James Nichol, Banker, Oban.

Sunderland School Board, September 2.—For plans and elevations for school buildings to be erected in James Williams-street. Premiums of £20 for the best, £10 for the second best, and £5 for the third best designs.

The Royal Northern Agricultural Society (Dwellings for Agricultural Labourers), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Admiralty, September 3.—For the supply of locks and lock-furniture to Her Majesty's Dockyards.—Mr. F. W. Rowsell, Superintendent of Contracts, Admiralty, Whitehall.

Batley, September 2.—For sewering, levelling, flagging, and channelling Union-street.—Mr. T. Dean, Town Clerk, Public Hall, Batley.

Birmingham, September 2.—For the construction of a double-line of tramway.—Borough Surveyor's Office, Moor-street, Birmingham.

Blackburn, September 3.—For the erection of greengrocery stores on the Market Ground.—Mr. C. H. G. Beck, Town Hall, Blackburn.

Blakeney National Schools, September 9.—For the erection of the Blakeney National Schools.—Messrs. Midland & Son, Architects, Clarence-street, Gloucester.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

Brownhills (near Walsall), September 14.—For the erection of a police-station and cells.—Mr. R. Griffiths, Architect, Martin-street, Stafford.

Bradford, September 4.—For the erection of a stuff warehouse in George-street, Leeds-road.—Messrs. Milnes & France, Architects, Bradford.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 6, 1872.

A MILLION STERLING OF PLUMBERS' WORK.

NOTHING better illustrates the extreme difficulty of managing the affairs of so great a city as London than the proposed regulations which are to affect its water supply. These regulations are issued by the Board of Trade, and are intended to "meet" the difficulty which besets the supply of London with water on the constant service principle; but unfortunately "meeting" the difficulty has been supposed in this instance to mean nothing more or better than going half way in the direction required—that is to say, doing something for the water companies and nothing for the public.

London is provided with two of the necessaries of life—gas and water—by public companies, through an infinite ramification of pipes. Gas is supplied constantly, the consumption being regulated by the requirements of each person using it. Every customer takes what he wants and pays for what he consumes, all the gas used by one consumer being made to pass through a "meter," and to register itself as it passes. The case of water is widely different. The supply, instead of being constant, is intermittent. The consumer is forced to store as much as he wants in a cistern, and the company's charge is based on the size of the cistern and the supposition that it is filled and emptied a certain number of times in a year. This is neither so fair nor so convenient a system as the other. The cistern is always larger than is required, and consequently the consumer is charged for more than he habitually uses, and if, under any circumstances, more water than a cistern-full is required by any London householder during the twenty-four hours he is quite unable to supply himself. Nor does the evil end here—the main water-pipes not being always full, there is very often no water to be had when a conflagration breaks out, and many thousands a-year must be wasted from this cause alone.

We have touched on one side only of the water-supply question, and, perhaps, the weakest side, for if we were to dwell on the sanitary interests involved we should only strengthen the case in favour of a constant supply. There is, therefore, every reason to rejoice that steps have been taken towards the procuring this great boon for Londoners; but the nature of the first step is so very much like a gigantic blunder, the operation of the regulations will be so oppressive and their result so very inadequate, that the greatest disappointment cannot fail to be felt when we come to examine the conditions under which this improvement is to be introduced. The natural way of making the change would have been, of course, to provide that each house should have a water-meter as it has a gas-meter; to take the necessary precautions against these meters being tampered with; to secure consumers against loss of water from causes beyond their own control, and then to leave the rest to their individual notions of economy. If, after, a fair price had been arrived at for water, to be regulated in some such way as the prices for gas are now fixed under the different Companies' Acts, there can be no doubt that a few months' experience of the cost of wasting water would make even the careless householder thrifty, and induce him to take the requisite precautions to limit the consumption of water to what was needed, and to take them effectually, and cheerfully, under the dictates of the best of all monitors, the selfish but all-powerful one, which lives in the breeches' pocket.

In place of this the Companies appear to have induced the Board of Trade to sanction a series of regulations which are to be compulsory, are not thorough, do not involve the principle of measuring the water supplied to each house, and, as far as we read them, do not permit builders who have new houses to erect to dispense with that great domestic nuisance, a cistern. The main advantages of a constant supply will thus be lost, and a burden of expense and trouble will be laid on the shoulders of the London householder in a most vexatious form, and with very doubtful results, the weight of which we shall presently try to estimate.

The regulations are of two kinds: some affect future buildings, and some existing ones; and though it is the second class which chiefly need revision, yet we are compelled, on reading the rules for supplying future houses, to take one serious objection. The use of lead pipe is imperative underground, and this, in the face of the prevalence of lead poisoning, and of the existence of such excellent substitutes as iron, plain or enamelled, and lead-encased tin pipe, is vexatious. Above ground, lead, iron, and copper pipes alone are permitted, which would prevent the use of any new invention, such as that, for example, Colonel Szcrelmey is understood to be perfecting, and might probably exclude the lead-encased pipe already alluded to. Other questions, however, such as the strength of pipe and use of stop-cocks, seem to have been judiciously dealt with.

But the sting of the regulations is in the alterations to be made in existing houses. No overflow pipe is to be permitted for the future, and in place of it is to be used a "warning pipe," and though the value of a warning pipe is nowhere defined, we may at least be sure that the present universal trumpet-mouthed waste must be done away with, and that very feeble protection, the common ball-cock, is to prevent the danger of an overflowing cistern. No underground cistern is to be any longer used. Every closet with a stool-cock is to be altered, and will be required to have some "efficient waste preventing apparatus," and every bath must be so rearranged as to secure that the inlet of water is above the outlets, and that the overflow waste be only a "warning pipe." We cite these regulations as the chief of those which involve interference with existing premises, and as far as we can see the alterations which they contemplate are intended to be compulsory. Now, it is not too much to say that if these rules are enforced, one or other of these changes will have to be made in almost every house in the metropolis, and while in large houses, with many cisterns and multiplied baths, the consequent plumber's bill may fairly amount to fifty pounds, there will be few cases where it will not reach fifty shillings. Let us, however, understate the case. Let us suppose that out of the 430,000 houses which, according to a fair estimate London now contains, only 400,000 require alteration, and that an average of 50s. represents the outlay on each, and we reach the startling figures of a million sterling to be squandered on plumber's work, and we venture to assert without any adequate or appreciable advantage to the public!

But it may fairly be asked, is there to be no return for this outlay? Will nothing result from this gigantic plumber's bill, and can such a body as the Board of Trade have sanctioned such a proceeding without some one to make a strong case? The answer is not far to seek. The regulations will no doubt diminish the consumption of water, check the waste of it, if you like, and will, in a clumsy and imperfect way, result in a saving, but the benefit of that saving will not go into the pockets of the public who pay for it, but will all be secured by the water companies. The cisterns are to be supplied, as now, without meters; the water-rent is consequently to be charged, as now, on a certain estimated number of cisterns full of water a year, and the result of the long plumber's bill will simply be that the consumer will get less water than he pays for, and will be subjected to all the annoyances of a periodical overflowing of his cisterns and his baths, and that the water companies will increase their profits.

Let the matter be grappled with fairly, and no one will welcome more heartily a change from our present system, full, as it is, of defects, to one which is in every respect its superior; but half measures will not do. The course of preparing for a permanent supply by arrangements to make it as little effectual as possible is short sighted. We cannot believe that the public, when they come to understand what is in prospect, will stand it, and we do not think that the proposed alterations can be done or will be done, in spite of official notices and all the formal and official machinery of the Water Companies' Act.

It remains, however, for the public to move. Unless attention be directed to the question, the companies will begin to enforce these regulations, for by them they have nothing to lose, and everything to gain. Those who will gain nothing, and spend much, deserve, we think, to be considered.

NOTES ON EARTHWORK.—XV.

THE force employed in the common way of driving piles is that of manual labour, but steam is used in Nasmyth's pile-driver. In any case the pile is driven by a succession of blows given to it by a weight raised up above the pile and suddenly released. The framework of a common pile-engine consists of a wooden platform framed together so as to be capable of being shifted along, and planked over. Upon the platform, at its front edge, a pair of guides or leaders are erected, between which the weight moves, and by which it is guided so as to strike the pile in the direction in which it is to be driven—usually vertically. The rope or chain by which the weight is suspended passes over a pulley at the top of the leaders. To keep these steady, braces are carried from the top of them at the sides and back down to the framing of the platform, and to counterbalance the tendency of the suspended weight to pull over the whole framework it is either weighted with kentledge or stayed with guy ropes, taken backwards to fixed supports, according to the position in which it is. When the pile has been brought and laid on the ground near the pile-engine; or, when working in water, is floated to the place, and the platform having been moved along so as to bring the leaders to the exact spot where it is intended to drive the pile, a chain is passed round it near its head and taken over the pulley at the top of the leaders, and the pile is hauled up to its position," and "pitched" in its proper place, a chain or rope being slackly bound round the pile and the leaders to keep it in position whilst being driven. For driving piles to short depths, and in easy ground, the ringing engine is the most useful and portable, the height of which is from 10ft. to 15ft. The weight employed with this form of engine is usually a wooden "tup," weighing about 3 cwt. or 4 cwt. To the other end of the rope, which is fastened to the tup and passed round the pulley, smaller ropes are attached, from eight to twelve in number, according to the weight of the tup, each of which is taken hold of by a man, and, all the men pulling together (as when bell-ringers clash a peal of bells, from which action this kind of engine probably takes its name of the ringing-engine), they suddenly let go the weight. Each man pulls with a force of about 40lb., so that if the tup weighs 320lb. eight men are required, 360lb. nine men, and so on. They lift the tup at each stroke from 3ft. to 4ft., and if after three or four minutes' exertion they have an interval of rest they will in this way give from 400 to 500 blows per hour.

When heavy work is required, from the piles having to be driven to a great depth or through a hard stratum of ground, the weight must be heavier or the fall greater, and usually both; the method of using the force to be employed must, therefore, be different, for more than about twelve men cannot well stand together to work effectually on the platform of a pile-engine; and a "crab" is commonly employed to raise the weight in these larger engines. A crab is an iron framework carrying multiplying wheels, whereby the force of one, two, or more men can be employed to raise a very much greater proportional weight. The cast-iron ram of a crab pile-engine is often about half a ton weight; but varies from 8 cwt. to 18 cwt., or more, and is suspended by a chain which passes over the pulley at the head of the frame and down to the winding barrel of the crab. When the ram has been raised to the required height, say 10ft., 15ft., or more, it is detached by a self-acting apparatus. In the top of the ram is a staple, and at the end of the hoisting chain is a pair of nippers, which are so made that they open on coming in contact with the staple, and grapple it, lifting the ram when the chain is wound upon. The power required to work the crab may be calculated in the following manner:—

Let the force required to be exerted in turning the handles of the crab be symbolised by the letter f.

Let the weight of the ram, with one-tenth added for friction of the machinery, be represented by W.

Let a = the length of the handle.

Let b = the radius of the spur wheel.

Let c = the radius of the pinion which works into it.

Let d = the radius of the barrel round which the chain is wound.

$$\text{Then } W = \frac{f\,a\,b}{c\,d}, \text{ and } f = \frac{W\,c\,d}{a\,b}.$$

For example, if the weight of the ram be 10cwt., W = (say) 1,200lb. Let a = 15in., b = 20in., c = 3in., and d = 5in.

If the force exerted at the handles by each man be taken at 30lb., and the number of men required to work the crab be represented by the letter n, then—

$$W = \frac{30\,n\,a\,b}{c\,d}, \text{ and } n = \frac{W\,c\,d}{30\,a\,b} = \frac{1200 \times 3 \times 5}{30 \times 15 \times 20} = 2,$$

the number of men required with a single-purchase crab, which is a sufficient multiplying power for this purpose.

In excavations for foundations laid under water, the method of proceeding by excluding the water by means of a coffer-dam is a very expensive one where the depth is great, although necessary in some situations. The ascertained cost of the dam for the construction of the Thames Embankment, previously mentioned, was about £18 per lineal foot of the dam, and that at Great Grimsby Docks was more than twice as much as that.

For the foundations of the piers of bridges a less expensive method is to sink cylinders, sufficient in number to cover an area of foundation that will sustain the load to be borne. In India these cylinders consist of brickwork or masonry, after the manner of well-sinking, but in England they have hitherto usually, if not altogether, consisted of iron plates in segments, bolted together with internal flanges, when of cast iron, so as to present a smooth surface outside and allow the cylinder to descend as easily as possible; or when of wrought iron the plates are rivetted together. The cylinders are usually sunk by weighting them with iron kentledge, the ground within being excavated as the sinking goes on. The excavation is sometimes carried on in the water within the cylinder, and sometimes the water is excluded, the proper system to adopt depending in some measure on the nature of the ground to be excavated, and in some measure on the size of the cylinders. Excavating under water may be done by divers with diving dress and helmet, or by bag and spoon work, in hard ground; or, in soft ground, as sand or silt, by the sand-pump, by Milroy's excavator, or by the "jham," as in India. It was stated in a paper read at the Institution of Civil Engineers by Mr. Imrie Bell that this latter implement has been used by the East Indians for many centuries, the mode of using it being for a diver to go down with it and dig it into the soft bottom as far as he can and then return to the surface immediately, for he puts on no diving-dress and helmet, as we do. It is a kind of scoop, something in the form of a large adze, about 2ft. 6in. long and 2ft. broad, which is let down by a rope and drawn up after the diver has dug it into the ground with his feet. The native method is first to excavate to the water level, then to lay a wooden curb, rather larger in diameter than the well, and upon this curb the brickwork of the cylinder or well is built, to a height of 8ft. or 10ft.; the sand being then excavated from the inside, the well or cylinder usually sinks by its own weight. In sinking the wells for the foundations of the railway bridge over the river Jumna at Allahabad, an improvement was made in the use of this native implement by attaching it to a pole, instead of sending divers down, by which, means, and by an arrangement of chains and ropes, the jham was dug into the sand and hauled up, the whole apparatus being worked from the top. The sinking of these cylinders was proceeded with by day and night shifts of men, ten men in each shift. The average rate of sinking was 5ft. per week for the first 10ft. down, 3ft. per week for the next length of 10ft., 2ft. per week for the next length of 10ft., 14in. per week for the next 10ft. length, and after that, below 40ft., from 6in. to 4in. per week. The cost of this method of sinking was 2s. per foot for the first 5ft., and, below that, 10s. per foot down, except where hard ground was met with, when an additional rate was made. In another bridge over the river Jumna, on the Delhi Railway (Messrs. Brassey, Wythes, & Henfrey, contractors), the sand-pump was adopted. It was also used in excavating the ground for the foundations of the New Ross Bridge over the river Barrow, which runs between the counties of Wexford and Kilkenny. It consists of a box, which is lowered down to the bottom of the water in the cylinder. Through the bottom of the box a pipe projects slightly downwards and rises inside the box nearly to the top of it. In the top of the box is a hole over which a pump-barrel is fixed. In the barrel is a heavy piston, fitting loosely, so that when it is drawn up by a chain worked from the top of the cylinder it descends again by its own weight. The whole apparatus is suspended by a chain from the top. To bring the sand into the box the piston of the pump is drawn up, creating, or tending to create, a vacuum in the box. After a few strokes of the piston, during which water only is drawn into the box and expelled through holes in its top and through valves in the piston opening upwards, sand rises through the pipe and falls over its top edge into the box, and when the box is full, which is known by a certain stiffness in the working of the pump, the whole apparatus is raised to the surface and the sand discharged. The average rate of sinking at the Jumna Bridge is said to have been about 6ft. in 8 hours. The outside diameter of the cylinders is 12ft. 6in., the thickness of the brickwork is 3ft. 4in., leaving an internal diameter of 5ft. 10in. The depth to which they are sunk is between 40ft. and 50ft., the material of the bed of the river in the dry season being chiefly sand for about 40ft. down.

In sinking for the foundations of the iron cylinders of the piers of a bridge across the Clyde at Glasgow, Mr. John Milroy, one of the contractors, invented and used an excavating apparatus which answered the purpose very well, and was afterwards used also at the New Ross Bridge over the River Barrow. In a paper read at the Institution of Civil Engineers, by Mr. Milroy, it was said that the bed of the river Clyde, at the point of crossing, consists of running sand 80ft. deep, below which is a stratum of hard material. If the action of the Indian jham be considered (that is an adze-like instrument about 2ft. deep in the blade, 2ft. wide at its upper edge and less at the point, let down in the water inside the cylinder and dug into the soft ground, and then, by a chain attached to the front of the adze about two-thirds of its length down from the top, that it is drawn up to a horizontal position, and the whole apparatus hauled up to the surface with the sand accumulated in the process), and if we conceive eight of these blades to be attached all round an iron ring or frame, and hinged to it, each blade having its hauling chain, and that there is a central boss, up to which each blade is drawn, and, further, that there is an upright rim attached to the outer ring or frame, we have the idea of Milroy's excavator. The outside diameter of the cylinders of the Clyde Bridge is 8ft. 4in. There are internal flanges of about 6in. wide, leaving a clear internal diameter of about 7ft. 4in., and the ring or frame of the apparatus is 5ft. diameter. The description of the instrument is this: "It consists of a horizontal frame of iron, with an outside rim 9in. in height, to which radiate, like the spokes of a wheel, T irons from a small cast-iron ring in the centre. To the bottom of the outside rim are hinged eight heavy iron spades, which, when drawn in, fit closely into each other, with their points pressing against the ring in the centre of the frame. The hinges of the spades are so constructed as to prevent them from turning back beyond the perpendicular, when allowed to fall open, or when being forced into the ground. The whole apparatus is strongly made, and it forms, when closed, a nearly watertight tray. When the machine is descending, the spades are let down in a nearly vertical position into the ground," and by a system of chains, worked from the top, the spades are drawn in through the ground and up to the central ring, or boss, and then the whole apparatus is drawn up to the surface, and the excavated material discharged.

The excavator, as adapted to the size of the cylinders at Clyde Bridge, was 5ft. in diameter, and it brought up at each lift about three-quarters of a cubic yard of earth. The progress of the excavation, and the corresponding subsidence of the cylinder, was from 12ft. to 20ft. per day of ten hours, inclusive of all interruptions, but when these have not taken up much time the progress has been as much as 25ft. per day. The action of the machine was as effective at the full depth of 100ft. as at 10ft., bringing up quite as much sand from the lower depth as from any other, although it had to pass through a much greater depth of water. Objection was at first taken to the adoption of this machine, in this running sand, that even if the machine succeeded as an excavator the fine sand composing the bed of the river would run into the cylinder as fast as it was taken out. It seemed to Mr. Milroy, however, that running sand depends for its locomotive power on the water which it contains, or rather in which it is contained, and that there would be no action from the outside inwards so long as the cylinder is kept full of water, or that the water inside the cylinder stands at the same level as outside.

At the Charing-cross railway bridge the cylinders are 14ft. diameter below ground; the average depth of water is 10ft. at low water of spring tides, and the range of tide is 17½ft. The strata through which the cylinders of the piers were sunk consist of varying thicknesses of mud and gravel, but nearly about 5ft. of mud and the same of gravel below it, below which is the London clay. The cylinders were sunk through the mud and gravel by divers excavating the material inside, wearing helmets. When the clay was reached, and the cylinders had penetrated into it so far as to prevent the water coming in under its edge, the water was pumped out, and the clay excavated in the ordinary manner, the cylinders being driven down by weighting them. When the engineer desires to examine the bottom of an excavation under water before the foundations are begun, he can do so in a diving-bell, but not, perhaps, very satisfactorily, or over the whole bottom. Moreover, when the edges of the cylinder come in contact with large stones, trunks of trees, or other obstructions of that sort, the process of sinking which we have described is not applicable. It is also considered by some engineers to be necessary that the water should be excluded when the cylinders are filled with concrete or masonry. For these reasons, all or some of them, another system of excavating the ground within the cylinders is adopted, that of blowing out the water in the cylinder under its lower edges, and so laying dry the ground to be excavated. The pressure required to be given to the air within the cylinder depends upon the head of water to be overcome outside the cylinder. In one or two instances—at the Saltash Bridge, and at the bridge over the Harlem river in America—a pressure equal to 85ft. depth of water was counterbalanced by the compression of the air within the cylinder. This is equal to a pressure of about 37lb. per square inch, over and above the pressure of the atmosphere, or to 2½ atmospheres in excess of the ordinary atmospheric pressure. The actual depth of water at the latter named bridge was not, indeed, so much as 85ft., but it was often necessary to raise the pressure to 37lb. per square inch, in order to expel the water through the surrounding material, which was compact.

Professor Rankine mentions a bridge where the cylinders were sunk 66ft. below the surface of the water, corresponding to a pressure of 29·4lb. above the ordinary atmospheric pressure, or to an absolute pressure of 3 atmospheres. This, he says, is said to be the greatest pressure under which the excavators can work without danger to their health, and although some men could work in a pressure of 3½ atmospheres in the two cases above named, yet some others could not, and in general it would appear that an absolute pressure of 3 atmospheres—that is, 2 atmospheres above the ordinary atmospheric pressure, is as much as most men can work in. At the Saltash Bridge the men worked only three hours at a time, and although Mr. Brereton, the engineer in charge under the direction of the late Mr. Brunel, could stay down for seven hours at a time, he says that the men were sometimes paralysed on coming out, and did not recover for two or three days.

Mr. Hawkshaw also related that in works of his at Londonderry some casualties occurred in working in a pressure equal to 75ft. of water.

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THE "NEW ZEALANDER" AND *BONA FIDE* ART IN S. PAUL'S CATHEDRAL.

WHAT is Art? It is a strange thing that it should be necessary in this day of so widespread knowledge to be obliged to ask so simple and elementary a question, and one would naturally have thought that all and every one would have been at least agreed as to the simple definition of the term; and, moreover, that all would have been agreed about the subject matter of it. But, unhappily, it is not so. Not only is the very term "Art" of uncertain definition, but the fact itself is a thing of doubt. It depends not a little upon accident as to where Art begins, and still more as to its precise value even when that commencement of it is fairly admitted. Hence it is that "a name," as it is termed, is of so much value in artistic matters, for it in a measure makes the fact of Art, or *no Art*, a sort of certainty in the public mind, and goes so far to solve all doubts and not a few difficulties. We surely live in times not a little singular. In the art sale-rooms of the day, and during the London season, it would seem to need only a little positive assurance on the part of the salesman, and a sounding name given to the thing to be sold, to accomplish almost anything in the way of "sale." Pictures painted by the unfortunate artist himself in the days of his Academy life, and before his "name" became a household word, and gladly sold by him for the mere cost of materials and time of actual labour, say for a fifty-pound note, are found to "go off" for three, or four, or five thousand pounds in sterling cash. The "name" does the work! Poor Shakespeare would never, had he lived in these days, have asked "What's in a name?" And this is, unfortunately some may think, one way of finding out what is Art, and what is not Art, and, perhaps, we are not far in the wrong when we affirm that it is the way, the universal, popular way, of finding out what is Art, and what is not Art. But there must be most surely a something better than this to go by, and there must be a real and true reason for Art and Fine Art as for everything else that is worth one. What, then, is Art, and how has Dame Nature contrived that it shall be produced? Is it confined to a very few, or is the faculty universal, and can the power which produces it be transferred to another in any way; or can that which by our definition is only to be produced by one single hand and intelligence be got at by the combined labour of a succession of hands, the hands of other workmen diversely constituted? This is the great question not only of the day, but of the future.

Let us begin with one or two simple *elementary* propositions and examples. Let it be first understood that art power is no contrivance or invention of man. It is not an artificial thing; but the spontaneous out-pouring of an inherent faculty, or faculties. Art is as natural to man as language itself, and if one phase of Art dies out another starts up to fill its place. Nature abhors a vacuum. Truth is, that now-a-days "manufactured" Art fills up the void or space that would have been in some way or other legitimately occupied by some one natural and necessary Art growth. It is a subject well worth the going into and analysing; but our more immediate object is to remark on the fact, but little noticed, that as Art never dies out, there is always, come what may, a succession of artists—artist minds and hands—perpetually, as time goes on, following each other. Each age produces its artists, more or less able and more or less original. Raphael, Michael Angelo, Titian, are succeeded by Reynolds, Turner, Millais, so that it depends not a little upon *the way in which the world treats its artists how its artists treat it*, and consequently how and in what way the world is impressed and moved by the art power which it produces. We live in an age when Art is at all points out of joint. What with the copying, or the trying to copy, the old arts and architectures, and the art manufacture even of those—for they are not fairly reproduced—we lose as it were the whole idea of a true and legitimate and natural Art, and architecture, and sculpture. In very rude and untutored times—indeed, in such as that which in the present day is typified by the fine art of the New Zealanders—we find examples of what may fairly be termed *natural*, though rude, art-handwriting, expressive at once of the *nationality* and *individuality* of the race of men who produce it. It is not so very very rude and void of "high Art" as might at first sight be imagined; for as Mr. Owen Jones—*vide* his book on Ornamental Art—has noticed, the designing and ornamenting of some of the *common things* in daily use among the New Zealanders is quite "classic," and worthy of a Greek and of those who designed and wrought out the Greek vases. What a pity it seems that the New Zealander should be dying out or be exterminated, or even, for that matter, "improved," for by it we miss surely all that it has been given him to do. And not only so, but the world may have to deplore the loss of all that he might in the future have done when his Art, his own natural and native Art, progressed. It is, indeed, an art language blotted out of the world's history. What, we may ask, is old England putting in its place? It is a curious subject, when looked at by the side of modern necessities. A savage New Zealander, knowing nothing but the putting up a merely useful and practically built structure, goes to work in his own way, and in a style of art of his own, to *ornament* or "decorate" it. There is no difficulty about it, he knows where to begin and where to end, and the whole of it when completed is as much a thing of his own, his country, his age, and his race, as the language and words he utters. It is rude enough; but how individualised and expressive, and, as far as it goes, true and real!

What a contrast is this—and we select it for its very rudeness, and what a startling thought it is—to our own more improved and educated way of going to work, *e.g.*, with the "decoration" of S. Paul's. It is just as though we had no living language, and to talk at all must needs go back to some almost forgotten tongue wherein to utter our thoughts. Sir Christopher Wren, the architect of S. Paul's, picked up a single style as he found it, and made it his own by a thorough reading of its forms and details. Of course, the after "decoration," had he lived to complete his building, would have followed easily and naturally in the same style. It was not *decorated* or even *ornamented*, but the inside of it left as a mere constructional building, with plain wall surfaces and mouldings and carving. It is now proposed to go to work, and try and find out what that style of Wren's day, as he saw it, was; and to then go to work—we are now leaving the art manufacturing part of the idea out of the question, and supposing it to be real and *bonâ fide* work—and complete the structure, ornamentally and decoratively, in the language of that almost forgotten time. It is to be an "instruction," to use a Parliamentary phrase, not to the poor working artists, who are to do the actual and painful work, not to the *painter* or *painters*, but to the architectural designer of the decorations, *on paper* be it noticed, to keep steadily to the style of Art in which Wren, the architect of the building, lived and worked. It is a thoroughly orthodox and fashionable conclusion to have come to, but most surely one which in no age or country in which the true idea of Art had a practical and working existence could have been come to. It is not a little instructive to thus compare things so unlike and far from each other—the rough and the highly civilised work; the rude though true work of the New Zealander—not him, by-the-bye, whom Lord Macaulay saw in his vision of the future, but the wild native man with a rude art of his own, unborrowed, and expressive of his own thoughts and feelings. We have taken the rudest Art that we can well see now-a-days by way of illustration merely, but it illustrates the true art theorem now so puzzling to the modern man—How to decorate S. Paul's in the style of to-day, so that every common man may read it!

May we—for it is opportune—make a suggestion or two while all this is going on? One half the Cathedral is now divided off from the other half by an awkward and useless canvas screen, reaching to the very roof of the church, and interrupting both the view of it and interfering most seriously with the sound. Is there any longer any necessity for this? All the work going on in the place may well be screened off in sections, if there be any necessity for such screening at all; but better let the public see the work as it goes on. Any visible progress made, and any happy way of doing it hit on, would, we cannot but think, help the subscription list. Besides, we should see the actual and *bonâ fide* artists at their work, and hence form some judgment of their capacity for it, and a friendly hint now and then might help matters before it be too late. It is really useless criticising after all the work is done. May we hope, therefore, to see this awkward and unsightly canvas screen taken down without further delay. It is a pity to hide half the Cathedral for years, for it must surely take years to complete so large and important a work. Another suggestion we would fain make: it is, that the frightfully obtrusive monuments which so startled Mr. Cobden, who declared that no such existed anywhere else on the face of the earth, most of them being of fighting men, should be well taken into account. They are sad things, the majority of them, and it is difficult to understand how any one ever came to think of them as works of artistic sculpture at all. How can *they* be harmonised with Wren's work? Would it not be well to confine them to the *aisles* of the Cathedral, with a something to notify to the future New Zealander, when he explores the place, why S. Paul's holds only *their* narrow homes?

C. B. A.

FOUNTAINS ABBEY AND RIPON MINSTER. —THE SIXTH ANNUAL EXCURSION OF THE YORKSHIRE ARCHÆOLOGICAL ASSOCIATION.

[FROM OUR SPECIAL CORRESPONDENT.]

ONE of the most delightful and interesting archæological excursions of the season has been that made on the 28th August last to Ripon Minster and Fountains Abbey by the Yorkshire Archæological Association. It was the sixth annual excursion of that society, and was most skilfully arranged by Mr. Fairless Barber, of Brighouse, the honorary secretary. Every facility was afforded for the inspection of all the objects of interest at both places by the Dean of Ripon and Marquis of Ripon, and no less than 300 visitors were gratified as well as instructed by the result. On reaching the ancient city, its Mayor and Corporation received the party with a formal address of congratulation, after which the Association proceeded at once to the Abbey, where Mr. Edmund Sharpe first gave a discourse in the refectory, which had been fitted up as a lecture-room for the purpose. This was illustrated by a fine collection of ground-plans to a large scale (¼in. to a foot) of Fountains Abbey itself, and numerous other Cistercian monastic establishments, for the purpose of comparison, and particularly that of Fontenay, in France, which has many curious points of resemblance with this, besides that of identity in name. By means of a drawing of an ideal Cistercian Monastery, Mr. Sharpe commenced by pointing out the peculiar distinguishing features of the buildings of this famous order of monks, imposed by S. Bernard, their founder, and gave a striking sketch of their habits and manner of life. The astonishing number of about 1,200 monasteries were established throughout Christendom during the two centuries after the formation of this order, through the influence of that most remarkable and devoted man, and the same general features were scrupulously retained in the whole of them, although towards the close of that period certain changes crept in through the laxity of discipline, which at last, to a certain extent, corrupted even this very order, which had been established as a protest against the irregularities prevalent among those of the preceding age. Still, throughout its existence, this of the Cistercians maintained its comparatively ascetic character, of which the silence to which their monks were doomed, save during one half hour of recreation a week, may be cited as an example; as also may be mentioned the exposure, even in this northern climate, of the inmates of the fratry, or common day-room, to the outer air by arched openings at its end, which are to be traced at several abbeys, in addition to the other doors and windows. Whether or not the first-named point of discipline was found too irksome to be borne we are, of course, without evidence to show, but in the latter case we have practical proof of subsequent relaxation, since in several cases these arched openings are found walled up with later work, and fireplaces actually inserted within them. Three times during the night the monks had to descend from their dormitory to the church, and add as many nightly devotions to those which formed their main daily occupation, and this practice is, as it were, recorded in stone, by the extant staircase which led down to the south transept from the dormitory, which occupied the floor above the fratry. In the refectory the general silence was broken by the practice of one monk reading to the rest during meals, and this is likewise attested by the remains of the gallery, with its corbellings for the pulpit used for this purpose, and the aumbry, or closet, in which the books were kept, while the scriptorium, a chamber over the chapter-room, shows to this day where these were transcribed and illuminated; and were there nothing else to be gleaned from these ruined abbeys, our gratitude would be due for the preservation by their means of much that would otherwise have been lost to literature during the troublous times in which they acted as havens of rest for the studious.

The architecture of the Cistercians shows throughout, in spite of a few late innovations, the same spirit of simplicity. Their abbeys were invariably dedicated to the honour of the Virgin Mary, and were situated almost always in valleys, generally, too, in their narrower and more sheltered portions, and were most simply and yet admirably and practically laid out, with due care for sanitary requirements. The church, of course, was the prominent and main feature, in the form of a Latin cross, with long nave and short chancel and transepts, each with three altar chapels projecting eastward. Towers were prohibited by the rules of the order, and a simple low lantern with pyramidal roof generally covered the crux. On the south side, between the church and the stream, the existence of which had been the cause for the selection of the site, the monastic buildings were ranged around a cloister in prescribed form as follows:—Next the south transept the sacristry and a cell, probably penitential, then came the chapter-house, with axis west and east, parallel to the church, the richest building among them being the hall, in which the abbot and monks meet for the transaction of all business and judgments. One or two ranges of seats surrounded the apartment, and the abbot's seat occupied the centre on the eastern side. Two ranges of columns divided the chapter-house into three equal aisles, and the scriptorium already described was situated above it. Beyond were one or more vaulted passages to lead to the precincts, or abbot's house, and then with axis changed to north and south, the fratry, or monk's day-room and dormitory over, divided by only one range of columns into two aisles. Parallel with this, in Cistercian monasteries, in contradistinction to others, the refectory projects with axis north and south from the centre of the south side of the cloister, the kitchen intervening between it and the fratry, and a lavatory in the cloister outside. A third building, parallel with the refectory and the fratry, at about the same distance apart, with some small apartments intervening, is continued westward of the cloister till it meets the south side of the church, and this has been usually considered to have been the hospitium or guest-house. This is also divided by a single range of columns into two aisles, and is two stories in height. Being of considerably greater extent than the fratry itself, it would appear altogether too extensive for the purpose for which it was supposed to have been appropriated, since such temporary accommodation could not have been needed upon a scale greater than that for the permanent inmates of the establishment. Mr. Sharpe has, from recent researches and discoveries of documents, far more reasonably assigned it to the residence of the sewing brothers of the monastery (the conversi) who tilled the extensive estates belonging to it, and were bound by less strict vows, and would naturally have exceeded in number the more select monks. An abbot's private house would ordinarily, with a few minor buildings, complete the type of a Cistercian abbey.

Fountains Abbey agrees with this in all essential particulars. It has a noble entrance gateway, reached by a bridge across the stream. It appears to have had two abbots' houses, one westward, and the other, the larger and later one, eastward of the general group of buildings. The latter includes a hall of noble dimensions, and two sets of kitchens, and, doubtless, was erected when in the more luxurious date the modest earlier house was found insufficient, and the great hall may have been used as a banqueting hall, and sometimes as a general judgment hall for matters connected with the district around, over which the abbot was lord, with powers of life and death, the mere internal business of the monastery alone being conducted in the chapter-house. A minute examination of the fratry shows two distinct relics of buildings, the present (Transitional) structure having incorporated the walls of earlier (Norman) date, evidently the first call on a modest scale was found quite insufficient when the abbey was worked out upon its subsequent magnificent plan.

The church also shows that even its original size, ranking as it did with most Cistercian abbey churches, did not suffice for the ambition of its owners. The whole eastern part beyond the crux was, therefore, rebuilt about A.D. 1170, to which date the later abbot's house and hall are referred. The choir was then lengthened in the beautiful Early English style, and made with five bays, with an eastern transept beyond, called the nine altars, though it is doubtful if it had more than seven. This is an exquisite structure, corresponding with the similar feature in Durham Cathedral.

The nave and aisles, of eleven bays in length, with the unique feature—as an English one—of the narthex porch to the west, with its charming arcade on coupled shafts, and the first transept and crux, are of the fine Transitional work of about A.D. 1147. The nave arcades have cylindrical piers, with smaller columns attached on the sides towards the aisles, supporting cross semi-circular arches, from which sprang other larger ones with their axes north and south to cover the aisles, a most curious and unusual arrangement, the more remarkable as it is found to have been also adopted at Fontenay Abbey — the Fountains of France before referred to—showing that there must have been some correspondence in their design and other respects. The main arcade arches, as all the similar constructive arches of the Transitional portions of the building, are pointed, while the ornamental ones and those over small openings, as doors and windows, are semi-circular. This gives, to superficial observers, an impression that, viewed externally, the building is Norman, but that internally it is Early English, and Mr. Sharpe, referring to this, remarked that some French theorists had jumped to the conclusion that this arose from a quarrel between lay and clerical architects, and that as a compromise this arrangement had been come to; whereas the fact was that in those days they preferred the round arch and used it wherever they could, but found it failed, practically, from two causes—first, the outward thrust was so great it often overpowered the abutments, and secondly, in large arches the voussoirs were so slightly wider at the extrados than the intrados, the sides being nearly parallel, that they were apt to slip down. This latter is a point not often noticed, and yet, in innumerable cases, it has led to the distortion and even destruction of large semi-circular arches. Clearly as Mr. Sharpe put this matter, some of the local press, who pretended to report him, have fathered the French theory referred to upon him, and have altogether omitted his refutation of it. At the end of the north transept is a noble tower of stately proportions, but of late, even debased, detail. This, of course, was another innovation upon the simplicity affected by the earlier Cistercians, but if it reflected upon their want of obedience it speaks well of their taste, for it is just the feature needed to give a pyramidal form and architectural effect to the whole pile of buildings.

As to the detail of this Abbey of Fountains, with the exception of that in the tower, all is admirable, yet remarkably simple. The mouldings are well worth study, but of carved foliage there is little, and of sculptured figures there are none. There are several points which have as yet not been cleared up, as, for instance, the curious screen and staircases at the extreme east end, the arcades of which are late imitations of those which line the lower part of the walls of the eastern transept. This work seems of the date of the great east window above it, which unfortunately superseded the original arrangement. One very remarkable puzzle was, however, cleared up at this meeting. In the easternmost bay of the nave are pits with walled sides enclosing hollow pottery, the object of which has given rise to much discussion. Mr. James Fowler, of Wakefield, a zealous antiquary, read a short paper at the conclusion of Mr. Sharpe's address, giving an abstract of some researches among French documents as to the use of certain acoustic pots, placed in such positions that they might make "singing better and cause it to resound the stronger," and in which these very ones at Fountains were referred as an experiment that had entirely failed in producing the anticipated effect.

In conclusion of what was noticed at the Abbey, we would refer to the frequent traces of whitewash to be seen on the walls, and which, according to tradition, the Cistercians affected as their sole means of internal decoration, abjuring more highly-coloured treatment. Their glass, also, was generally plain, and never more richly ornamented than with grissaille patterns, such as those which have been preserved at Altenburg, near Cologne. How far their reticence in these respects should guide our conduct may be a matter of question, but if due regard to it could preserve us from the garish coloured glass with which so many of our churches are disfigured, it could but be to their advantage.

We have ourselves little space to speak of Ripon Minster, whither the Association bent their steps after partaking of the dinner that had been provided for them in the Town Hall of that city. Although not prominent among cathedrals, it is full of interest, and the recent work of restoration, not yet finished, has brought out many points. All the styles of Mediæval architecture are represented in it. Thus the crypt under the central tower is Saxon work (674—678), probably S. Wilfrid's, but executed by Roman workmen. Then portions of the chapter house, vestry, and crypt below (1070—1100) are said to be the work of Thomas the Norman, who was appointed Archbishop of York by William the Conqueror. Of Transition work (1154—1181) there are the transepts, three bays of the north side of the choir, the greater part of the south wall of the south side of the choir, and the buttresses supporting the chapter-house and vestry, portions of the nave piers adjoining the west towers, and parts of the two western piers supporting the central tower. These are the work of Archbishop Roger, who also built a nave, as wide as the present one, without aisles. The Early English style (1215—1255) is well represented by the unique west front and towers, and by the vaulting and circular windows of the chapter-house. The Geometrical (1288—1300) is to be seen in the two easternmost bays of the choir and east end; and lastly the Perpendicular (1460-1520) is to be traced in the two bays of the south side of the choir, the choir screen, the east side of the main wall of the south transept, and the south and east sides of the central tower and nave.

Thus the structure is an epitome of Mediæval architectural history, and presents many most curious problems and interesting examples of the manner in which additions and alterations were made in those days, with slight respect for preceding work. New oak vaulting is being placed over the nave; that recently executed over the chancel is uncovered, and looks well, but the decoration on the spandrels is meagre and ineffective. There is much painted glass of modern date within, and the west front is being filled with it. Of this none is good, and most very bad, and the whole causes one to regret that Cistercian principles as to these matters do not now obtain. Some very absurd openings have been made in the back of the stalls, and sundry supports of the side screenwork cut away in deference to notions prevalent among the local authorities. Still, with these and a few other drawbacks, a creditable work has been nearly brought to a close at Ripon Minster.

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EXETER CATHEDRAL RESTORATION.

AFTER patient deliberation, the dean and chapter, acting with their architect, Sir Gilbert Scott, have decided what shall be done with the screen that separates the choir from the nave of the Cathedral. About this screen there was a war of words when the restoration commenced. One party advocated its removal, and the other insisted upon its retention. The dean and chapter were averse to the removal, and Sir Gilbert Scott strongly opposed it, intimating that if it was intended to pull down such an interesting relic of antiquity another architect must be employed in his stead. Both with the chapter and the architect the propriety of piercing the screen was allowed to remain an open question, but at last the matter has been settled, and settled in a way which will, it is hoped, prove satisfactory to all concerned. While adhering to their determination to retain the screen proper, and to the belief that the organ cannot be placed in a better position than where it is, at the top of it, they are agreed that the general appearance of the building will be improved, and the convenience of the worshippers be increased, by the perforation of the unsightly stone and rubble wall of separation against which the return stalls of the choir rested. The inner arches, now filled up by rough masonry, will, in point of fact, be cleared out, and the open stone-work, similar to that which runs down the north and south aisles, from the reredos to the screen, will be extended across the back of the screen, and against it the western walls will stand. This piercing of the screen will afford a partial view into the choir from the nave, and will enable people in the nave to hear the service and probably the preacher from the choir. Sir Gilbert Scott fully approves of this plan of dealing with the screen, because the principle of preserving what is worthy of preservation is adhered to, and the objection to the complete cutting-off of one part of the building from the other by a thick wall is surmounted. Another important resolution arrived at by the chapter is that there shall be no interruption in the work of restoration. They have undertaken the risk of directing that the restoration of the nave shall be commenced as soon as the choir is completed. This second portion of the costly enterprise will entail an outlay of £10,000. Sir Gilbert Scott will be instructed to consider and advise upon the works required for the nave's restoration as early as possible. It is not intended that the ceiling of the nave shall be coloured or the floor paved with marble, as in the choir and lady chapel, the nave being regarded as in some degree the vestibule to the more important part of the sacred edifice. But in the nave there is much fine and delicate carving requiring careful handling —the minstrels' gallery, for instance—and an idea of the extent of the reparation may be gained from the estimate that, in addition to the eighty tons of Purbeck marble used in the choir, 100 tons will be needed for the repair of the shafts of the pillars in the nave. By October or November it is anticipated that the eastern end of the church will be so far out of the hands of the stone-masons that the erection of the stalls may be commenced. The woodwork, which is of an elaborate character, has been entrusted to Messrs. Farmer & Brindley.

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EXETER DIOCESAN ARCHITECTURAL SOCIETY.

THE annual meeting of this Society was held (yesterday) Thursday week, at the College Hall. The report read by the Committee stated that plans by Mr. St. Aubyn for rearranging the chancel, and for repairing and erecting new choir and par close screens for the church of S. Patumus, North Petherwyn, have been considered and approved, and a grant made in aid, but since then the Duke of Bedford has announced his intention to undertake the repair of the whole of the church. The east and south chancel walls, the north nave, arcade, and clerestory and north aisle, are of Transitional fine Pointed work. The original south arcade has been supplanted by Late Third Pointed work, as well as the north and south transepts. The Committee express a hope that the old north arcade and clerestory may be preserved in the rebuilding, which seems to be absolutely necessary. The character of the ground plan of this old church is just that, omitting the transepts, which meets present wants, for a relatively broad nave and narrow aisles, with lean-to roofs; and the Committee suggests, as an interesting subject of inquiry, the date and the reason of the existence of the broad aisles which are to be found in by far the greater number of Devon churches. The Committee think that such an inquiry would lead to this conclusion: that the narrow aisles, say of a First Pointed Church, developed into the broad aisle of a Third Pointed Church through a gradually increasing regard for the lesser altars which these aisles contained. Altered plans, by Mr. R. M. Fulford, for the proposed chapel-of-ease at Avon Week; plans by Mr. J. C. Gould, of Barnstaple, for the proposed alterations and repairs in the nave of the church of Down S. Mary; and plans by Mr. White for rearranging, reseating, and erecting new roof, and effecting general repairs in the church of the Holy Trinity, West Down, North Devon, have also been before the Committee. Amongst the church work proposed in the neighbourhood the Committee mention the proposed enlargement of S. Andrew's Chapel, Exwick, from designs by Mr. Hayward. The tie-beam roof of that chapel was the last erected in compliance with the old requirements of the Church Building Society, one of which was that no roof is safe without a tie-beam. A north aisle, tower, and spire, are to be added to the chapel, and a new parsonage will also be built. Mr. Hayward read the treasurer's report, from which it appeared that the receipts for the year, including a balance of £22 at the end of last year, amounted to £168 10s. 4d., and after deducting the expenditure, there remained a balance of £43. The report and balance-sheet having been adopted, the Rev. W. T A. Radford read a long and interesting paper on "The Treatment of the Inner Face of a Church Wall." He expressed his disapproval of what he said was now the almost invariable practice of architects, to leave the stone on the inner face of the wall bare and rough, and contended that this should only be done when the material used was in itself beautiful, or might be rendered beautiful by judicious combination. He urged that while the bare stone was most suitable for the exterior, the interior should be treated as we treated our houses—rendered as beautiful as possible. He deprecated the idea of abandoning the use of colour because we had lost for the present the art of retaining the colour for any length of time, and suggested in lieu of colouring the use of tapestry hangings, or even, where cheapness is a consideration, properly designed and suitable paper hangings.

THE ARCHITECTURAL ASSOCIATION'S NORTHAMPTONSHIRE EXCURSION.

(*Concluded from page* 162.)

Fifth Day.—Friday, August 30.

ON Friday, a most interesting day's work was commenced with a visit to the exceedingly fine church of

Finedon, or Thingdon, as the parish is sometimes called. Of this church Mr. Sharpe said it was designed and built completely in the Curvilinear period. It was one of the most remarkable parish churches of that period in the kingdom. They might compare it very advantageously with Heckington Church, which they visited in their first excursion, and which was justly considered to be the finest church of its period in the kingdom. In fact, Finedon Church was the Heckington of Northamptonshire. Its single defect was the absence of foliation in the windows—a great peculiarity of which, in the case of all the windows of a church, he knew no other example, the whole of the windows being of that form to which the term "reticulated tracery" has been given. There were one or two exceptions to this general rule, and these occurred in the transepts, where the head of the window is formed by the intersection of the tracery bars, continued in a curved form up to the window arch. These, however, were also without foliation. Were it not for the marks of lateness that pervaded the whole of the design they would have been disposed to suppose from these early features that the church belonged to the earlier rather than the later part of the Curvilinear period. But the character of the foliage—though very deeply relieved, broadly designed, and well-curved—and the profiles of all the mouldings, left no doubt whatever that the building belonged to the latter end of the period. Any one who remembered the exquisitely-carved foliage to be seen in the Church of Heckington and two other churches of the same date that they visited in Lincolnshire the first year, to be seen not only in the capitals, but in the admirable series of works contained in the chancels of these churches, would form a correct idea of the debasement that had later set in, and which was so plainly observable in the carved work of this church—to be noticed in the capitals of the chancel arch under the sconcing arches. He attributed the design of the whole church to about the date of 1340—1350. The nave has three very wide compartments, with slender lofty piers, the arches being depressed, the centres from which they are struck lying below the level of their spring. In the place of the west crossing arch there is a remarkable structure, built evidently to resist the thrust of the arches that span the side aisles. They would see another example of this straining arch at Rushden Church, both of them being evidently designed by the same hand. The arch appears to have been inserted after the nave was built, for it carries mouldings which indicate its Rectilinear origin; while that at Rushden, on the other hand, was probably contemporary with the work of the nave itself. The design is a very remarkable one, although there were instances of these straining arches in other buildings of earlier date. But in none were they treated with the amount of elaboration they had here. The chancel was originally vaulted, and consisted of three compartments, each containing a handsome three-light Curvilinear window, which, as well as the east window of five lights, have all the same reticulated tracery without foliation. There has been, also, a handsome series of arches forming a piscina and sedilia, but these have been grievously multilated, the whole of the front arcade and carved work being cut off. The importance and finish of the tower and spire are equal to those of the rest of the structure, and in comparing it with Heckington, they observed the absence of that ornamental but useless feature, the pierced flying buttresses springing from the corner pinnacle to the base of the spire. The solid character of the buttresses all round the church add greatly to the substantial appearance of the whole edifice. Over the porch is a parvise, which contains a valuable library. Mr. Sharpe praised the manner in which the restoration had been effected.

Irthlingborough Church was next visited. This structure is chiefly remarkable for its detached tower or campanile. The edifice was once a collegiate church, and this fact, together with the construction of the campanile, affords some clue to its origin and use. The tower is surmounted by a beautiful octagon of two stages, finished with a pointed roof or low spire. From an examination of the interior of the campanile there is evidence that it was used for the domestic purposes of the college. The campanile is connected with the church by a large Late Decorated porch, which occupies nearly the whole of the west end of the nave. There is evidence that some of the pillars were built on the original Norman foundation. The tomb of the founder of the college is in the south chapel. In the church there are examples of Lancet, Geometrical, and Rectilinear work. The next church visited was at

Higham Ferrers, which possesses many attractions to the architect, being one of the best illustrations of church architecture in the county. The western front of the splendid tower, which is 71ft. high, is curious in some of its architectural details: for instance, the bas-reliefs in the head of the doorway illustrating events recorded in the New Testament. The beautiful hexagonal spire is 99ft. high, and was built in 1631 to replace one which had been blown down. When the spire was rebuilt in 1631, much of the old material was used, and the character of the original preserved as much as possible. In commenting on the external characteristics of the church, Mr. Sharpe said they had in the tower and spire a very good commentary on Raunds tower and spire. They were pretty much of the same proportions, treated much in the same style, but in the subsequent period. But here they came back to the Lincolnshire flying buttresses and pinnacle. It was one of the few instances in which such an elaborate work was designed for effect and not for utility. The spire was Curvilinear and the tower Geometrical, just as in Raunds Church the spire was Geometrical and the tower Lancet. With reference to the internal characteristics of the church, he said they had there what they had in Keythorpe Church in Lincolnshire, which was the only other example they had met with in their three years' excursions, a two-aisled nave. He thought it extremely probable that there always were two aisles; judging from the mouldings he did not think the three ground stories were separated much from each other in point of time, if at all. The door of the Transitional period on the south side showed that the aisle with which it was connected must have been the original aisle, at all events. It was possible a change had been made, but he was disposed to think there were two naves and two chancels. The reticulated tracery windows on the south side were remarkable. There was a monumental arch that might belong to the founder of some part of the work. At the west end there is the weather moulding of the pitch of the first nave, which was without a clerestory. It was another illustration of the amount of money which was spent in the ornamental part of the church—as the tower cost considerably more, no doubt, than the rest of the work. The ground story was built precisely at the time, between 1230—1250, the period of the great architectural movement. The chancel proper is divided from the chancel aisle and the Lady Chapel by carved screens. On each side of the chancel are stalls with carved subsellæ, and these stalls are the only peculiar features of the church remaining to indicate its former collegiate character. The chancel is divided from the Lady Chapel by two Decorated arches, one of them forming the canopy of a beautiful tomb. The church is noted for its rich display of monumental brasses. The church has been well restored within recent years at an expense of £5,500. The excursionists then proceeded to

Rushden Church, which is interesting both as a parallel and a contrast to the church at Higham Ferrers. Its tower and spire, said Mr. Sharpe, afforded them the best opportunity of comparing the work of the three periods; in fact, of the four periods. In the first place they had Raunds in the Lancet period, Higham Ferrers in the Geometrical period, Oundle in the Curvilinear period; and here they had the most graceful example in this or any other county of the Rectilinear period. The parapet and two courses underneath it were remarkably beautiful from the richness of the quatrefoil work. The architects of this period did not copy each other, and it was only architects who were not inventive enough that did not themselves design. The pinnacles were peculiar. There were those insignificant pinnacles and flying buttresses again, which to the eye of the architect, had not altogether a satisfactory effect. There were shallow porches; the west doorway was, perhaps, inserted. It was flanked by flying buttresses, very useful and practical. In the inside of the church the earliest work was to be seen in the sedilia and piscina—a beautiful series—of Late Lancet or Early Geometrical work: he should say between 1230—1250, though approaching the last date—probably 1245. The Geometrical window at the end of the north transept appeared of the same date. It might be that the south transept was of the same date; it had the original sconcing arch. The font was very singular, and belonged to the Rectilinear period. Referring to the stained glass in one of the windows, Mr. Sharpe wished our glass-stainers would take some lessons from the tone of that to be seen in this church. The treatment of stained glass was infinitely more delicate at that date than now. Then there was that grand straining arch, which, no doubt, belonged to the same time, and probably was designed by the same hand, as that at Finedon Church. The stone reredos in the north aisle is one of the few structures of that character in England. Unfortunately, a portion of it has been removed to make way for the erection of a tomb.

Irchester Church was the next on the route. The best feature in the church is a little double piscina, extremely elegant, of the Geometrical period. This contrasts well with the one seen in the last church, that being much more pretentious, and of the Lancet period. This church belongs to the great architectural movement of the valley of the Nene, and must have been one of the latest buildings constructed during that movement—1250—60. The piers and arches of the nave, the chancel arch, the double piscina and arches opening into the chancel aisle, were all of that date. The piers were octagonal instead of circular, the only case they met with in this excursion of that period. The bases showed the triplet row, the distinguishing mark of the period. In the north aisle of the chapel was the founder's tomb. There is a pretty little porch belonging to the Curvilinear period; it must have been constructed very early in the period. The tower, built evidently long after the nave, is a very interesting example of the Rectilinear period.

Earl's Barton Church, which was next visited, is one of unusual historic interest, and in it were exemplified all the seven periods of Gothic architecture. The magnificent Saxon tower is one of the most remarkable buildings of that period in the whole kingdom. Then there was the Norman church that was built against the Saxon tower. What became of the Saxon church they did not know, but only fragments of the Norman church remained. Those fragments, however, were sufficient to show that the limits of the present church were co-extensive with the original Norman church. Portions of the tower arch were Norman—very late Norman, perhaps, from the coniferous capitals, but the cones were thick and short, a circumstance they did not often find. Then the billet moulding was very profusely employed, which was hardly ever seen in Transitional work. The present arch was not improbably a restoration of the original circular arch in the Pointed form. Then there was the south doorway, which a remarkably good example of a Norman doorway of three orders. In the chancel was an interesting and beautiful arcade. They had also, of the same period, one of the chancel windows on each side, the piers of the Norman chancel arch, and the inside of the lower part of the chancel wall, with this arcade upon them. All the orders and shafts of the doorway had their capitals enriched with zig-zag, the beak-head moulding, the scollops, and all the other ornaments characteristic of the Norman period. Then there were the rising sedilia in the chancel. All these Norman remains were in the places they were originally constructed for, the Norman church having been burnt or otherwise destroyed. In the Transitional period the piers of the south arcade were erected. The arch mouldings were quite characteristic of the period. The illustrations of the next period they had in the chancel—they were in the Lancet period. The whole of the chancel was rebuilt in that period. After that they came to the Geometrical period. The north story might have fallen down, or had been burnt down—or some other calamity might have befallen it—and had then been built in that period. The whole of that ground story was built between 1245—1315. It was rather late in the period, as evidenced by the mouldings—probably 1290—1300. To that period belonged the outer porch, the south porch, which covers the Norman doorway. Then came the Curvilinear architects, with their beautiful windows; to them were due all the windows round the church, the characteristic being what was termed reticulated tracery. To them also belonged two windows in the chancel. In the Rectilinear period they had the clerestory, also the north doorway and one window in the chancel. That brought to a close the architectural history of the church. They had nothing in the tower arch like the wonderful impost mouldings—the thick imposts—at Barnack, but they had all the other features of Saxon work, the rib running down the side of the building, the circular doorway, and the upper baluster shafts. The chancel arches of these Saxon buildings were finished with a great round circular moulding and a square flat beyond it. It was a very odd and primitive idea of moulding, but they would see it in this door very pronounced indeed. In that door they would see the type of all the arches that the Saxons built. It was stated that the church was built on the centre of a Roman encampment. The church is now undergoing restoration under the direction of Messrs. Slater & Carpenter, whose names, together with the fact that the restoration is under the management of the Northamptonshire Architectural Society, are a guarantee that the work will be executed with care and judgment. The chancel is nearly completed.

Friday's proceedings were concluded by a brief visit to S. Peter's, Northampton, which is well known as a splendid specimen of Late Norman. The party dined at the "George" Hotel.

Concluding Day.—Saturday, August 24.

On Saturday morning the first visit paid was to *S. Sepulchre's* Church. Of this edifice, Mr. Sharpe said it was one of those churches that had been referred to as an example of the Pointed arch appearing in Norman work. It had always been believed, until within the last few years, that the whole of the circular part, including the upper part (excepting the windows) was of one date. The old part was erected by Simon de St. Liz, who returned from the Holy Land about 1134, which date coincided with the style of the lower part of the building. It was quite clear, and had been satisfactorily ascertained by the Rev. G. A. Poole, one of the best authorities in Northamptonshire, that the upper part of the structure, the octagon, was built later in the next century, in fact about the time when the nave, &c., was added. As regarded the plan, they knew there were only four churches in the country built in imitation of the plan of the Holy Sepulchre, although imitation on a small scale. The circular part was called the Church of the Holy Sepulchre. The other imitations were one at Cambridge, one at Mapleston, and the Temple Church in London, built about 1160, which was about the date of the enlargement of this church. The choir, which was an addition, was of about the same date as the building of the original circular church at the Temple. The north ground story is Transitional. The eastern portion of the church has recently been added by Sir Gilbert Scott. After a flying visit to S. John's Hospital, the visitors proceeded to

Cogenhoe Church, which illustrates five of the seven periods of church architecture. There is a little south Norman doorway. The chancel is Late Transitional, and very interesting. The north chapel, the arch of which is original, the chapel having been destroyed and rebuilt, is Lancet. The windows in the south and north aisles are Curvilinear. The west tower and the west window of the south aisle are Rectilinear. Mr. Sharpe considered the nave piers were a puzzle: they were of very debased work, and were very ugly. They appeared to belong to the latest and worst part of the Lancet period. On further examining them he was of opinion that the piers were the original piers of the west end of the church, and of Transitional arrangement, and that there were shafts in the hollows, but that the shafts had been taken away and the arches rebuilt with the old stones, but that the capitals were Rectilinear. There is a founder's tomb, with the effigy preserved.

Whiston Church, which was next visited, is of the Rectilinear period from one end to the other—a very good example of a lofty, well-proportioned church. The west tower, which is of the same date as the church, is a noble structure. The chancel is remarkable for its shortness. There are several fine monuments in the church.

Castle Ashby Church was the last place upon the programme to be visited. The Rev. Lord Alwyne Compton explained the extent of the recent restoration of the church, and was glad to say that the walls and windows required no restoration of any kind. They had not been touched at all except in the tower, and there, in two places, two single-light windows had been placed as an accurate restoration, as the heads of those two windows had remained in the tower. The roof of the nave was quite a poor one, and of no character whatever, and the present new roof had been substituted for it. The same remark applied to the chancel. Mr. Street was the architect for the restoration, and he also designed the screens of the Lady Chapel. The pulpit was the old one, and so was the reading desk, the latter being used to form a vestry. Inigo Jones was employed at the Castle at the time they were made, and he probably designed them. The church contains some fine ancient brasses and monuments, with modern monuments by Marochetti & Tenerani. Mr. Sharpe said a great deal had been done in the restoration to make a church of comparatively little importance very becoming indeed. Nothing could be more admirable than the roof of the chancel, and the restoration of the roofs of the aisles was very good. The history of the church was very simple. He saw no obvious reason why, in rebuilding a church, the Rectilinear architects should have left the windows of the north aisle in their original Curvilinear form. The whole of the rest of the church belonged to the Rectilinear period, with one exception, and that was very interesting. There could not be two better examples of Norman and Transitional doorways than Earl's Barton for the former, and Castle Ashby for the latter. In the doorway of the latter there was a reminiscence of Norman work. For instance, they had the zig-zag, but it was treated in the delicate manner which our English architects, at the earliest periods of English work, adopted and practised. They would observe the incipient dogtooth, and an idea that was worked out afterwards—viz., the pyramidal flowers. Lord Alwyne Compton said it had been suggested at previous times that the doorway was a Norman work, and that the dogtooth had been cut upon the square plain mouldings of a Norman arch. There was also the incipient working of a flower. The dogtooth and flower were not contemporary with it, he thought. The work was not quite so true as it would be if it were original. Mr. Sharpe said these Norman doorways were constantly taken down and set up again. The doorway in question was much more likely to have been an inner doorway, or the doorway of the north wall, than to have been the outer doorway of a porch so low as that. In Norman work the outer doorway was very considerable. On examining the outer doorway he said he thought it extremely probable the doorway had been taken down and set up again. *A priori*, there was no necessity for searching for a reason to account for the prevalence of the dogtooth and the zig-zag in the same set of arches. Now attention had been drawn to it they were recognising it all over the kingdom. He had thirty or forty examples of the real dogtooth carved out of the sides, to be seen with the zig-zag, and on that account there was no reason to suppose it may not be what he conceived it to be, a Transitional arch throughout.

From Castle Ashby the excursionists returned to Northampton, where the final dinner took place at the "George" Hotel, Mr. Sharpe presiding, and Mr. J. Douglass Matthews in the vice-chair. Most of the excursionists afterwards returned to London.

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MONMOUTHSHIRE AND CAERLEON ANTIQUARIAN SOCIETY.

THE members of this society visited S. Briavel's on Tuesday week to inspect the castle and church, where the Rev. W. F. Allen, the vicar, read a paper on each. According to Mr. Allen, the Castle appeared to have been first built by Milo Fitzwalter in 1130, for the purpose of curbing the Welsh. The present remains were built about the year 1276, and they consist of two towers on the north side flanking the entrance gateway; the court-room, with old stabling beneath; the ante-room, where the miners' court was held; and the remains of what might have been the drawing-room, with a cellar below. There are also the remains of a small oratory at the eastern end, with an Early English piscina in the south wall. The angular-headed arches, and the triangular buttresses of the entrance towers, mark the building as belonging to the middle of the thirteenth century, and in these particulars is somewhat similar to Chepstow and Goodrich. Every precaution was taken to render the place secure, for not only was there a portcullis placed in each of the three main archways, but the side doorways were protected in the same manner, so that if even the second court were gained a foe would find himself assailed on either side as well as in front; and it was surrounded by a moat. The castle has passed through some strange vicissitudes. From the lodging-place of a king and his nobles, it became a public-house, and subsequently it was used as a school. The walls are fast tottering. With regard to the church, which was next visited, Mr. Allen said that he wished the restorer had kept as much as possible to the old design, and had not replaced good work by what was not in strict keeping with the earlier building, or by substitutions which offend not only the antiquary, but every lover of ancient architectural example. The principal feature in the whole building had been destroyed by removing the tower from its proper position—viz., nearly over the rood loft, to where it now was.

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The Council-General of the Manche has voted a subvention of 150,000fr. towards the construction of a pier at Cherbourg, in front of the Place d'Armes, on condition that the town will spend 300,000fr. for the same object, in which case the State will place 450,000fr. at the disposal of the administration of the Ponts-et-Chaussées to finish the undertaking, which—the estimate is—will cost about 800,000fr.

NOTES ON THE CHARACTERISTIC TREATMENT OF MATERIAL IN DESIGN.*

(*Continued from p.* 159.)

THE characteristic use of stone in a multiplicity of small parts causes it to lend itself very readily and naturally to what may be termed "constructive polychromy;" the employment of stones of varied and contrasting tints to give variety of tone to a building: and there is no source of effect in masonry more legitimate than this, when discreetly employed. The most common way of using it, as we all know, is in horizontal bands, but I think it might also be used very successfully in larger masses, building, for instance, the lower portion of a building with a dark and heavy tinted stone, and the upper with a lighter tint. Where there are in one quarry variations in the colour of the stone, this may impart a picturesque tone and surface to a building by the fortuitous mixture of various tints; at all events I should think it far preferable to take the stone as it comes, than to pick one tint for the whole building with a view to uniformity. On the other hand, this kind of effect needs to be resorted to with caution, and should, in fact, be the result of chance rather than design, or it will tend to defeat its own object. I cannot help thinking this is the case in a church recently completed in this neighbourhood, where the stonework, which appears to have come from two different sites, is arranged in motley irregular bands of red and grayish; if this had really been the way in which the stone came to hand it might have been called a pleasing and picturesque variety; but when we learn that much trouble had to be taken by the architect to indoctrinate the masons in this way of arranging the stone, it has impressed one unsatisfactorily, as what may be called "an accident done on purpose." To come from these general ways of arranging stone expressively, to what may more properly be termed ornament, it may be said that this should be designed with distinct reference to the character of stone as a brittle granular material, incapable in most cases of being cut into thin laminæ, or of long retaining a very sharp edge. Now in regard to this view, it appears to me, that, in the first place, nothing is more foreign to the true character of stone treatment than the division of it into panels, when merely used as ornaments. A panel in wood work is a natural way of treating the material, because it has sufficient toughness and tensile strength to bear framing together in comparatively thin stiles, and to stand in thin panels, and, therefore, this is an economical way of treating the material; but we know that stone cannot advantageously be put together in this way, and, therefore, it is a direct contradiction to design it as if it could. This does not apply, of course, to sunk panels hollowed for the working of a carved surface ornament within them; in this case the panel has an obvious meaning and object, both as furnishing a marked border to the ornament and as protecting it from damage by weather or accident; but panels for panels' sake, over a stone wall, always strike me as a mistake, and as giving at once a weak and unmasonic character to the work. Then in regard to mouldings and such methods of imparting light and shade to a building, it is very necessary to consider the quality of the particular stone we are using, and to regulate the depth of sinkings and the contour of mouldings accordingly; remembering that the softer and more granular the stone, the more must sharp edges be eschewed, and delicate curves, as these will not retain their form. It may be only fancy, but when inspecting one day the ruined, or rather the unrestored portion of St. John's Church, at Chester, I could not help thinking I detected, in the peculiarly large scale and massive proportion of the roll mouldings and fillets visible on the portions least decayed, a special recognition on the part of the old builders of the wretched character of their stone, which could not be expected to retain any more delicate impressions. However that may be, there is no doubt that in regard to another very extensive branch of modern architectural practice we have been very neglectful of this consideration as to the capability of the material: I mean in the introduction of the Greek style into this country. Waiving the question whether this introduction be, as regards climate and manners, an entire mistake or not, there certainly ought to have been more consideration given, in working out the style here, to the difference between even our best building stone and the marble used by the Greeks; and I believe the comparative failure among us of the revived Greek architecture is due not only to difference of atmosphere, but to the fact that the Greek was essentially a marble style, and that the delicate contours of its mouldings and ornament, and the slight sinkings and small fillets constantly employed, cannot be satisfactorily impressed upon, or retained by the coarser material in which we have to work, and to which the round rolls and hollows of the Gothic mouldings are so precisely suited. For the same reason, chamfering, almost unknown where marbles abound, is a natural and reasonable treatment of stone, as it is, in fact, a deliberate removal of the sharp edge which, from the nature of the material, is sure to remove itself, in a ragged and unsightly manner, sooner or later. We tacitly recognise this in our treatment of granite; for where we employ a polished square granite pilaster, we never chamfer its edge off, from an intuitive feeling that there is a kind of beauty and character of its own in this hard, sharp, clean edge, when executed in a material which we know will bear and retain it. In regard to carved ornament generally, it appears to me that as a general rule this ought to be rather cut into the masonry than standing out from it, and I think this will be found to be the rule in nearly all the best Gothic ornament, that it nearly always occurs in a hollow or a sinking, from which it is relieved, so that it does not project beyond the main plane of the wall or the main line of the string in which it occurs: in other words, what I mean is that we should not cut away a large surface for the sake of leaving a small projection; not only for the reason mentioned before, the waste of material, but also because relieved ornaments so left always have a sort of stuck-on appearance, like the finery on a wedding cake, instead of appearing as part of the structure. It is this which gives such a very unsatisfactory appearance to the festoons and garlands which in the Roman and the modern French Renaissance styles seem nearly always to be the designer's *beau-ideal* of decoration, and which disgust us by the falsity of their attempt to look as if they were hung on to the structure, when we know, in fact, that they must be part of it, however the architect and stonecutter may conspire together to cheat our eyes. And lastly, in regard to the style of execution in carving stone, it appears to me that is best which does not attempt too much, which does not treat the stone with a pretence of its being a rough tensile material, capable of being cut into thin laminæ, and of leaving sharp edges everywhere. In this respect I think there can be no better examples of the right kind of thing in stone carving than are exhibited in many of the capitals of the Transitional period both in England and France. The large conventional leaves and lobes of these capitals, treated in bold rounded masses, completely recognise and emphasize the nature of the material in which they are executed; and, however we may admire the dexterity and sleight of hand displayed in the attempt at literal imitation of foliage in later Gothic carving, and still more, perhaps, in some of the modern revived Gothic work, we cannot help feeling that these are less satisfactory than the older style of treatment, because they are an attempt at what never can really be done, viz., the literal imitation of natural foliage in stone; and because even the imperfect attempt cuts up the stone into such thin and sharp edges as must render the lengthened preservation of the work very doubtful. This last remark, of course, applies to work in the present day, in which more elaborate *tours de force* of this kind are, I think, attempted than were ever aimed at in the most florid days of the genuine Gothic period, and with a very doubtful result.

A great many of the remarks made in relation to stone apply in pretty nearly the same degree to brickwork. There is one point in regard to brickwork, however, wherein the relation between construction and design has scarcely been properly sustained, in this country at least. It is universally admitted that "English bond," formed of continuous courses of stretchers and headers, is the strongest; it is certainly the most easily worked. Yet it is, I believe, a constant habit to specify "English bond," for internal walls, where the bricks are not seen, and "Flemish" for external, from an idea, I suppose, that the latter is prettier. Where the headers are burnt white, which is frequently the case, this only produces a monotonous chequer all over the building. But since "English bond" is the strongest, the sensible way would be to recognise this in the work, and to make the lines of headers a feature in the building, by employing them of a different colour, or in two colours, or with notched or billeted ends, and in other ways. The oddest thing about this "bond" question is, that, as appears from the interesting papers and sketches on the architecture of Holland, recently contributed by Mr. Brewer to the *Builder*, what we call "Flemish bond" is unknown there, and all the buildings are built in the so-called "English bond." Another feature common to the brickwork in that part of the world is the thick mortar joint, which is both more durable and has a better effect in giving a certain texture to the work surface.

(*To be concluded.*)

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* Read before the Liverpool Architectural Association by H. H. STATHAM, Jun., Esq.

AN ARTISTIC HOUSE BY AN ARTIST FOR AN ARTIST.

WE give this week two illustrations of a charming house recently built at Harrow Weald, for F. Goodall, Esq., R.A., the well-known painter. It is situated in a charming but secluded spot, about 1½ miles from the Pinner Station. It is of red brick, with Bath stone dressings, the upper portions being either timber work or weather tiles, and the whole covered with Staffordshire tiles. Internally, it has a somewhat elaborate oak stair, and a very large painting-room, which is shown in both our views. This room is placed due north and south, whilst the main portion of the house is placed more across the compass, so as to get some sun all round. The painting-room is 45ft. × 27ft., and about 22ft. high. Nearly the whole of the north end is window. There is a large south window, a west bay from which sunsets can be studied, and two windows on the east side. The whole of the works were carried out most admirably by Messrs. Jackson & Shaw, under the superintendence of the architect, Mr. R. Norman Shaw, A.R.A.

We think our readers will agree with us that the house is in every way worthy of the reputation of the painter for whom it is designed and the reputation of the architect by whom it is designed.

CANTERBURY CATHEDRAL.

CANTERBURY Cathedral has very nearly escaped destruction by fire. At eleven o'clock on Tuesday, the inhabitants of the city were alarmed at hearing the Cathedral fire-bell tolled lustily, and hundreds rushed to the Precincts. At that hour flames were issuing from the roof at the eastern end over Trinity Chapel, and a stiff breeze appeared to favour their spreading along the roof in a straight direction. The public authorities and private citizens immediately set to work with the view of helping to extinguish the flames. Three troops of military were promptly despatched from the barracks, but some time elapsed before much could be done, owing to the Canterbury Water Company's mains not being laid within the Cathedral Precincts. At half-past eleven the flames were at their highest, and there was every prospect of the fire, which was being fanned by the breeze, spreading from choir to nave. It was half-past twelve before the engines ceased to play and the danger of further damage was at an end. The extent of the wreck outside was easily noticed. The roof, extending from S. Thomas' or Trinity Chapel to the choir, had entirely disappeared, the only relic remaining being glittering masses of lead amid the blackened ruins above. The damage inside was fortunately trifling. Within that portion known as S. Thomas's Chapel—the spot where once stood the shrine of S. Thomas à Beckett—showers of heated lead had fallen through the "boss" in the canopy above. The beautiful mosaic pavement in front of it, which those who know Canterbury Cathedral will remember is railed off in order that it may not suffer injury, has been deluged by melted lead, but has escaped, fortunately, uninjured. It is believed, too, that none of the beautiful windows at this end of the Cathedral have been damaged.

The *Times* says that a thrill of distressing anxiety went through the heart of every Englishman yesterday who heard that Canterbury Cathedral was in flames. The destruction of that beautiful and venerable edifice would have been felt by every one with the keenness of a personal loss and the gravity of a public disaster. Westminster Abbey is the only great church that can be compared with Canterbury for its hold over the hearts of Englishmen. It would seem, in this instance, impossible to acquit the responsible authorities of evident neglect. Some "charcoal" escaped from a vessel in use by some men who were engaged in soldering the leaden roof. But did no one take the trouble to guard against the risk of fire "escaping" from the clumsy fingers of a British workman? The result, however, has been better than was deserved. But how many other great buildings like Canterbury Cathedral are abandoned from time to time to the carelessness of workmen, and how many would be found on an emergency to lack the means of commanding an ample supply of water? The art of extinguishing fires has now risen to such perfection that, if the alarm can be given in time, and if sufficient water be available, nearly every conflagration may be stopped or averted. There is no reason why these two conditions should not be complied with in the case of every great public building in England, and to neglect them in the case of such edifices as Canterbury Cathedral is almost a crime against patriotism.

The *Standard* remarks that our cathedrals are the heirlooms and the pride of the English people. Antiquity cannot be created; and if Canterbury Cathedral had been burned down—if any one of our cathedrals was burned down—no earthly power could rebuild it for them. It behoves us all, therefore, to take all the guarantee which we can for the security and the permanence of these sacred structures, and there are at least two steps which might and must be adopted without delay. In the first place, when repairs are instituted, some precaution is necessary whose effect shall be not to render every plumber, with his implements, who comes inside the historic precincts a potential source and centre, as he at present is, of an uncontrollable conflagration; in the second place there must be in the immediate neighbourhood of all our great national buildings, sacred or secular, an accessible and copious water supply. When both these requisites are fulfilled, we may congratulate ourselves that Canterbury Cathedral is safe from fire—till then we cannot.

THE LONDON INTERNATIONAL EXHIBITION OF 1873.

HER Majesty's Commissioners for the Exhibition of 1851 announce that the third of the series of Annual International Exhibitions of Selected Works of Fine Art (including Music), Industrial Art, and Recent Scientific Inventions and Discoveries, will be opened at South Kensington, London, in April, 1873, and closed in October, 1873. The precise dates will be duly announced. The Exhibition will take place in the permanent buildings erected for the purpose, adjoining the Royal Horticultural Gardens. It will consist of three divisions—viz., Fine Arts, Manufactures, Recent Scientific Inventions, and New Discoveries of all Kinds.

The productions of all nations will be admitted, subject to the decision of competent judges as to their being worthy of exhibition, and provided they have not been exhibited in the previous International Exhibitions of this series.

The three divisions of this exhibition will be subdivided into the following classes. For each class a separate Committee of Selection will be appointed.

Division 1.—Fine Arts. Fine Arts applied or not applied to Works of Utility executed since 1863.

Class 1.—Painting of all kinds, in oil, water-colours, distemper, wax, enamel, and on glass, porcelain, &c. Mosaics; drawings of all kinds.

Class 2.—Sculpture, modelling, carving and chasing in marble, stone, wood, terra-cotta, metal, ivory, glass, precious stones, and any other materials.

Class 3.—Engraving, lithography, photography as a fine art, executed in the preceding twelve months.

Class 4.—Architectural designs and drawings, photographs of completed buildings, studies or restorations of existing buildings, and models.

Class 5.—Tapestries, carpets, embroideries, shawls, lace, &c, shown not as manufactures, but for the fine art of their design in form or colour.

Class 6.—Designs for all kinds of decorative manufactures.

Class 7.—Reproductions—*i.e.*, exact full size copies of ancient or Mediæval pictures painted before A.D. 1556. Reproductions of Mosaics and enamels; copies in plaster and fictile ivory. Electrotypes of ancient works of art, &c.

Division 2.—Manufactures. Machinery, Substances, and Processes.

Class 8.—Silk and velvet fabrics.

Class 9.—Steel:—*a*, Steel manufactures, other than cutlery and edge tools; *b*, cutlery and edge tools.

Class 10.—Surgical instruments and appliances.

Class 11.—Carriages not connected with rail or tram roads.

Class 12.—Substances used as food:—*a*, agricultural products and manurial substances used in cultivation; *b*, grocery, drysaltery, and preparations of food; *c*, wine, spirits, beer and other drinks, and tobacco; *d*, implements of all kinds for drinking exhibited for peculiarity of shape or for novelty, and for the use of tobacco.

Class 13.—Cooking, and its science.

Division 3. Class 14.—Recent Scientific Inventions and New Discoveries of All Kinds.

All industrial objects submitted for exhibition must be new. With the view, however, of increasing the educational value of the Exhibition, her Majesty's Commissioners will, wherever possible, set aside certain spaces for collections of ancient works in the Industrial Division.

The arrangement of objects will be strictly according to classes.

Foreign Governments which desire to have space guaranteed to them can obtain such guarantee upon making application before the 1st January, 1873. Such guaranteed space will not, however, be reserved for any foreign objects which are not delivered at the time appointed by her Majesty's Commissioners.

Objects produced in the United Kingdom, as well as those objects produced in foreign countries, for which space has not been guaranteed, must be sent direct to the building for the inspection and approval of judges appointed for the purpose. All objects must be delivered at the proper places in the building, which will be hereafter advertised, and into the care of the appointed officers, free of all charges for carriage, &c., unpacked, labelled, and ready for immediate exhibition.

No rent will be charged for space. Her Majesty's Commissioners will provide glass cases, stands, and fittings, steam and water power, and general shafting, free of cost to the exhibitors, if their requirements in these respects be notified to her Majesty's Commissioners before the 31st of January, 1873, and the Commissioners will carry out the arrangement of the objects by their own officers, except in regard to machinery, and other articles requiring skilled assistance and special fittings, which must be provided by the exhibitor.

Her Majesty's Commissioners will take the greatest possible care of all objects, but they will not hold themselves responsible for loss or damage of any kind.

Prices should be attached to all works of art, and (whenever possible) to all other objects intended for sale at the close of the Exhibition. Price clerks will be appointed to register the selection of objects for purchase, and to introduce the seller to the buyer.

Every object belonging to Divisions II. and III. must be accompanied by a label, stating the name and address of the exhibitor, the special reasons, such as excellence, novelty, cheapness, &c., why it is offered for exhibition, and (whenever possible) the retail price at which the public can obtain it.

The latest days appointed for receiving each class of objects are as follows:—

On Saturday, March 1, Paintings in Oil and Water Colours.

On Monday, March 3, Paintings in Oil and Water Colours.

On Tuesday, March 4, Sculpture.

On Wednesday, March 5, Sculpture.

On Thursday, March 6, Fine Art Furniture and all Decorative Works—Stained Glass—Reproductions—Substances used as Food.

On Friday, March 7, Fine Art Furniture and all Decorative Works—Architectural Designs—Substances used as Food.

On Saturday, March 8, Engravings, &c.—Tapestries, &c.—Cooking, and its Science.

On Monday, March 10, Steel, Cutlery and Edge Tools—Cooking, and its Science.

On Tuesday, March 11, Surgical Instruments and Appliances—Machinery and Raw Materials—Scientific Inventions.

On Wednesday, March 12, Designs for Decorative Manufactures—Machinery and Raw Materials—Scientific Inventions.

On Wednesday, March 19, Silk and Velvet.

On Monday, April 7, Carriages.

SCHOOL BOARDS.

BRIGHTON.—The competition design of Mr. Banister Fletcher, which was selected by the school board as the best, has received the approval of the Education Department.

STAPLEHURST.—The Staplehurst School Board held a special meeting yesterday (Thursday) week, to consider in what way to deal with Mr. Bridge, whose tender for the erection of the schools, viz., £4,200, was accepted out of six, although the Board was surprised to find the lowest tender exceed £4,000. The Board has recently received four new tenders, the amounts of which will not be disclosed until the meeting of the Board to-morrow (Saturday). Eventually it was resolved that no tenders be opened, and that Mr. Lewis (the architect) be requested to obtain from Mr. Bridge the amount to which his tender could be reduced by the omission of some ornamental detail in the façade.

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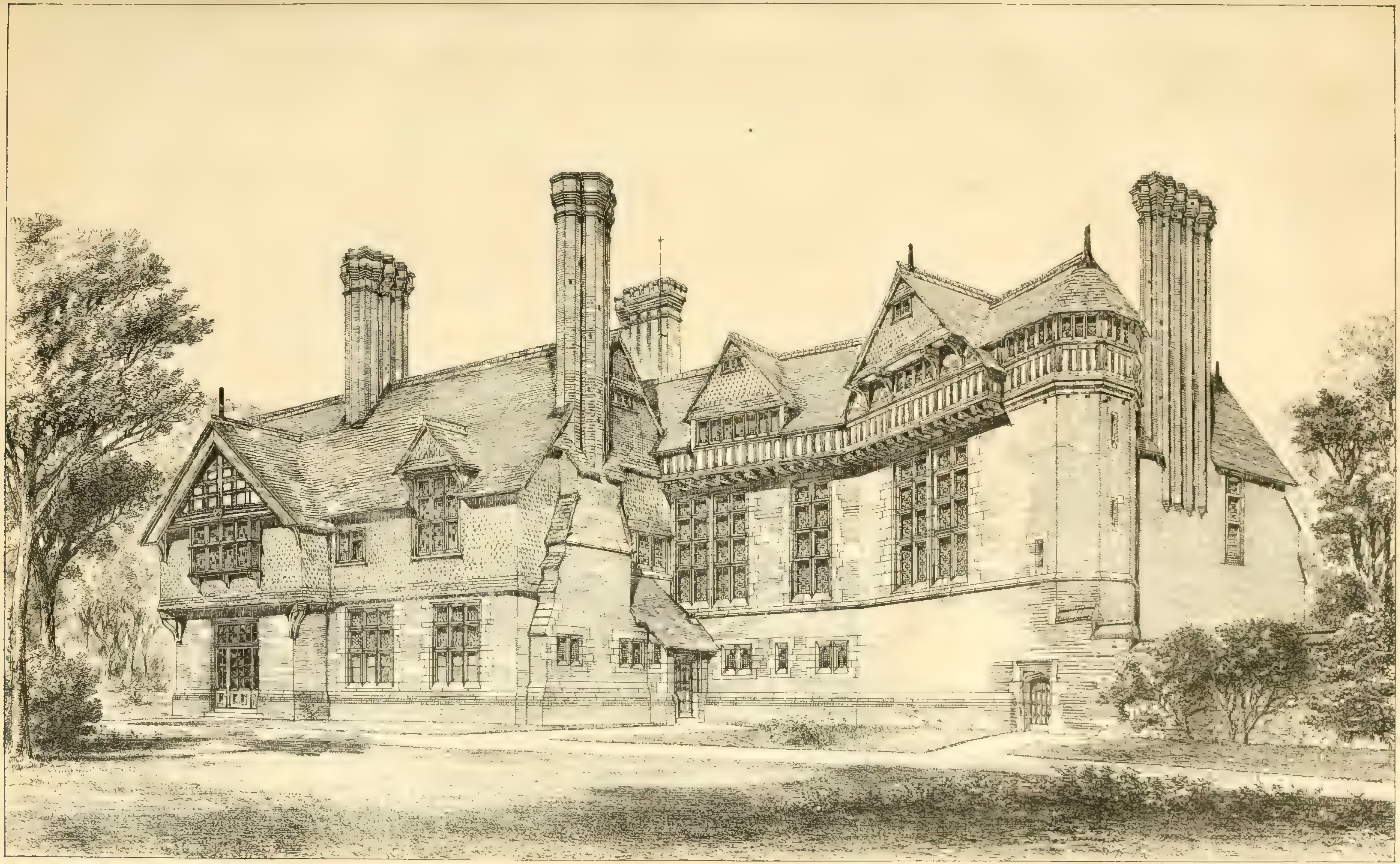
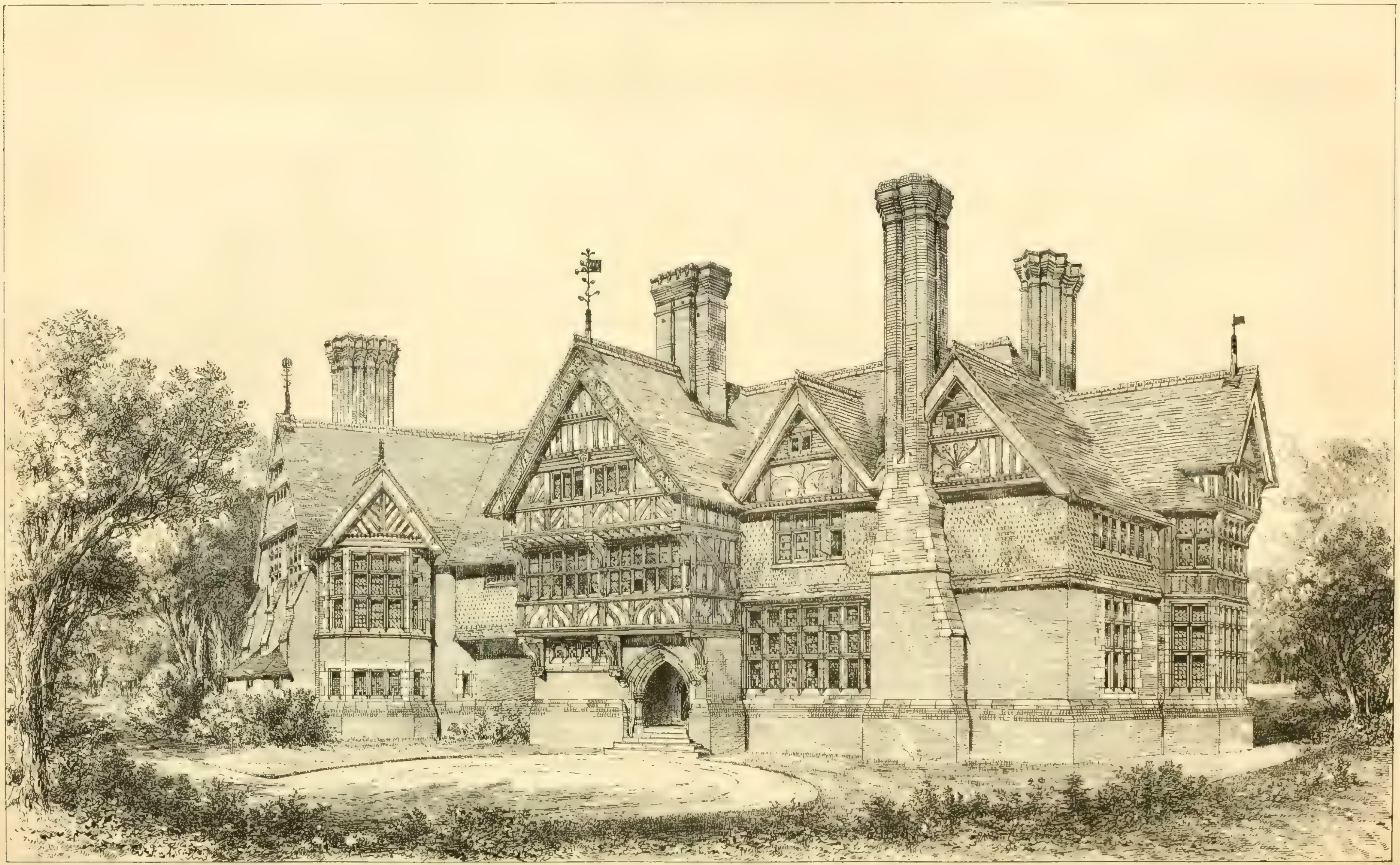
MODERN BERLIN. — A Berlin correspondent speaks of that city as having been "reconstructed," and says that if it be not quite completed already, the process of change is certainly going on day by day. The old Prussian capital of (say) ten years ago, of before the recent victories, the triumphal processions, and the political development of the Fatherland, is melting out of sight, whilst a new and more expensive city takes its place. In mere builders' work the change is very noticeable; and as to population, it increases at the rate of a thousand a week. Fresh shops and houses, smarter shop-fronts, and taller dwellings, are to be seen at every turn. The value of real estate in Berlin has doubled and quadrupled since the hot summer days of the seven weeks' war.



HOUSE RECENTLY ERECTED AT HARROW WEALD

FOR F GOODALL R A — R NORMAN SHAW, R A ARCH^T



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HOUSE RECENTLY ERECTED AT HARROW WEALD

MODERN ARCHITECTS AND THEIR WORKS.—V.

A SUCCESSFUL class of modern architects is that Country Gothic class who look on Sir George G. Scott as their prophet. This sort of architect indulges in no kind of speciality. He makes no experiments: churches and houses, town halls and shops, theatres and markets, are all one to him, and Mr. Bloomfield's cheap churches and concrete walls only excite his pity. A steady-going Gilpinish sort of citizen life makes him blossom forth at tea meetings. He is great on missionaries and the efficacy of prayer; modern science he hates, and he inwardly curses the artist architect. Possessing these, amongst other virtues, he can command the suffrages of hopeful mothers, and his office is thus always well stocked with pupils. These save him clerks, and to maintain a constant supply he is not particular as to the amount of the premium. He would always like to get his top price, a hundred pounds, but rather than lose a chance, he has been known to accept less than a fourth of that sum. His works are extremely various. Parsonages and schools are favourite subjects, and for these he has always his prescription ready. Shops and street fronts, too, are profitable patients, and the very name of warehouse has a soothing sound in his ears. His library contains Scott's "Secular Architecture," Sharpe's "Parallels," the "Glossary," and above all, "Designs for Church and Villa Architecture," by Brooks and other distinguished artists. His works, wherever they are, may be identified by the coarseness of bead and fillet in all his mouldings, for the nosings of buttress, and stringcourse, and gable, are always from five to ten times as thick as they ought to be, and every other fillet and bead follow suit. In other words, detail is eschewed—that is to say, the poor young pupils make the drawings, and detail, unfortunately, is the very last thing a pupil picks up, even, indeed, if he ever finds it. The general practitioner, however, depends very much on external aid, and his incapacity either to design or draw has resulted in the establishment of numerous manufactories where all this is done for him, and thus the land is flooded with rawnesses and crudities springing from the great English commercial maxim--Buy in the cheapest, and sell in the dearest market. Sometimes the pupils fail, and then our family architect has recourse to partnership. An old pupil of his who has, since his pupil days, distinguished himself at the Architectural Association, or who has laid up a great store of foreign sketches, is generally preferred, and in a few years the pupil is absorbed, loses all his old energy, gives up the fight, and sinks into the merest echo of his quondam "master."

It is curious to note how very little the general practitioner cares for art or anything belonging to it. To be well in with the old family solicitor, to know the leading doctors, to be the familiar friend of the most influential of the clergy, and to be on good terms with possible mayors, are his chief ambitions in life; for he knows well that it is by cultivating the friendship of general practitioners in other walks, and by a careful adjustment of the give-and-take principle, and not by any study or knowledge of architecture, that the country architect succeeds. Now and then he comes across some one who dabbles in ecclesiology, and on these occasions he covers his own deficiencies by the most fulsome adulation of the fashionable architect of the day, and utters all sorts of vapid platitudes about the purity of his style, his genuine sense of English Gothic, and his freedom from all the vagaries of his *confrères* Among the architectural forms which our country friend is found most to favour, we cannot fail to notice the flat stone-coped gable, the two-stage buttress, the square chimney set diagonally, the cheekless dormer, and a *very* pointed arch. His materials are selected with the same love for art as that he exhibits in his choice of form. If the work is of wrought stone, the depth of the courses are from 15in. to 24in. If the building is of brick, there are sure to be dressings of stone to every quoin and opening on the important sides. I say the *important* sides, because happily the kitchen or back part of the house is left to shift for itself without stone dressings, and sometimes (rare luck) without even drawings to guide the builders. Of woods, pitch-pine, with a large bold grain, is very highly favoured, and is an almost certain sign of the class. Oak is rarely used, but deal stained and varnished a deep resinous brown is an every-day mixture. To leave the wood alone, or to paint it, are courses to be deprecated; for if the family architect is ever eloquent, it is sure to be about bringing out the grain of the wood. Indeed, his notion of Domestic Gothic has always had some mystic connection with stain and varnish. His roofs, as a rule, are covered with slate, which he sometimes manipulates in a stripy pattern of two colours. Now and then, to be very cottage-fied, as he calls it, he will use a dull brown or blue black tile with delicate roll ridges and hips, but he can never be induced to adopt red tiles, and as to vertical tiling, he holds it in utter abomination, whilst he luxuriates in ornamental crests of the fleur-de-lis type. But the thing which appears to cost his pupils the most trouble is the pitch of his roofs. He is never sure of it. Here it is low, producing even in the youngest pupil's eyes a squat square-shouldered look. There it is so sharp and spire-like that all the walls seem squeezed up, and the building has a pinched contracted spiny look. But when the general practitioner is called into a more than ordinarily costly work it is almost amusing to see how laboriously he flounders in his endeavour to copy the stately proportions and grand tone of his hero, Sir. G. G. Scott. He aims, too, at securing in the execution the same kind of remarkable "finish" which is so characteristic of all Sir G. G. Scott's work, and the result is that he invariably produces a cast-iron expression. The ashlar, the brickwork, the dressings, are all done to a gauge; joints are reduced to the minimum, and no end of money is thrown away on a mathematical nicety which is totally out of place. The carving is chiselled and polished to that peculiar smoothness of surface and accuracy of line we nearly always recognise in cast-work. Not a fault is to be found in it; every boss and every curve are as true as if they were engine-turned. Such life as there is they file out of it, and the character of the natural material they sand-paper away. There is, however, a depth lower even than this, where architecture sinks to a condition of hollow pretension under the professional guidance of the general practitioner and the fostering care of the friends of the local Athenæum, Ecclesiological Society, or Philosophical Institute. Little coteries and cliques of local savans whose chief business in life seems to be to pet one another with fond congratulations, to give gratuitous lectures before admiring aunts and cousins, and to remain gloriously unconscious of everything in the way of progress or energy beyond the radius of their short tether. The architect-member of these coteries is quite a superior sort of person; he dabbles in archæology, so far as to give him courage enough to attempt a lecture on the ancient architecture and antiquities of his town and neighbourhood. He is eminently "respectable," for he is also eminently thin-skinned. He dislikes, it is hardly necessary to say, all modern criticism which is not in the old-fashioned descriptive style, and he encourages the fine arts by employing carvers to produce life-size statues for his buildings at £10 per head. It would take up half a column merely to name the towns where one or other of these general practitioners flourish. For some, there is just the faintest excuse that they have not had the benefit of any local school, nor do they possess any modern examples whereby to profit. There are, sad to relate, many scores of towns which are barren alike of old or modern architecture that is at all worthy of the name. But no such plea can be advanced on behalf of the crude, pretentious, and lifeless buildings which have sprung up of late in such towns as Bristol, Leicester, and Plymouth. The old works in all, and the modern works in one of them, might have been expected to have exercised a more salutary influence than they appear to have done. But there are places upon which example, precept, and even experience seem to be thrown away; like the man who, having obtained one of the most picturesque and satisfactory houses of modern times by employing our last-elected A.R.A., has taken the finishing into his own hands, or appears so to have done, and with an ignorance or wilfulness of amazing obstinacy has set up the ordinary marble mason's mantel and every day *register* in even the principal rooms, and has adopted cast Brummagem gas-fittings of ornate—and therefore of the very worst—description. The sorrow of the artist in an individual case like this is often by no means slight, but it is quite a trifle compared with that he feels when passing through towns that were once among the fairest of England; he sees not only that the few good modern works remain unappreciated, but that the beautiful forms of the old ones are daily becoming rarer without one single voice being raised on their behalf, or one local architect profiting by the loss. E. W. G.

CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

THE inaugural meeting of this Association was held at the Town Hall, on Monday week, at eight o'clock, when the Mayor and members of the Town Council received the Association. At the opening of the proceedings,

Mr. Rhodes, in the absence of the outgoing president, the Ven. Archdeacon Wynne Jones, briefly addressed the assemblage, and introduced the new president, Sir Joseph Russell Bailey, M.P., who delivered the inaugural address.

Mr. Matthew Rhodes then read a paper "On Wales and the Saints of the Sixth and Seventh Centuries." He gave a history of the principal saints of Wales, and especially of S. David—of his sanctity, his pilgrimage to Jerusalem, his consecration as bishop, his appearance at the Welsh Synod of 519, and his death. Authorities differed as to the date of his death, which had been placed at from A.D. 544 to 589.

The Rev. Mr. Barnwell, secretary, offered a few supplemental remarks on the saints of Wales.

Mr. Rees followed with some remarks on the death of Llewellyn, the last Prince of Wales, who was killed near Builth by some soldiers of Edmund Mortimer.

In the course of a brief conversation which followed, it was mentioned by one of the members that at Llanrwst was a stone coffin which was said to have once contained the body of Llewellyn. There was also a stone in a wall outside Conway which contained an inscription to the memory of Llewellyn. Another gentleman, however, affirmed that the Llewellyn for whom the stone coffin was made was altogether a different person to the last Prince of Wales; and after this declaration, which seemed to come as a surprise upon some of the visitors, the meeting broke up, it being then ten o'clock.

On Tuesday a large party set on their first excursion by railway. The route was first to Talgarth, where the church was inspected, and afterwards to Bryullys Castle. Then, taking the train again, Aberedw Castle and Builth were visited. Aberedw is rendered historical by its associations with the last Prince of Wales. Here are also the mouldering walls of a castle. Builth is the locality of the death of Prince Llewellyn. The body of the Prince was said to have been buried at Cefyn-y-bedd, which means "the ridge of Llewellyn's grave." There is a tradition that Llewellyn was killed with a broomstick, and that no broom has ever grown in the vicinity since, although it abounded before! The town of Builth was nearly destroyed by fire in 1692. The excursionists got back to Brecon about six p.m.

At the evening meeting, Sir J. R. Bailey, M.P., in the chair, Professor Babbington gave an account of the day's excursion. At Talgarth was a tower, or fortified house, or castle, though hardly worthy of the name. The church there was built at two periods—the first in the time of Edward IV., and the second about the fifteenth century. There were remains of a rood loft, which ought to be preserved. In reference to the church at Builth, he trusted that should any alteration take place in the church, the embattled tower would be left untouched; to alter it as he understood was contemplated would be an act of barbarism.

Two papers were read—1. "On the Battle of Mortimer's Cross," by Mr. Flavell Edmunds, editor of the *Hereford Times*;" 2. "Notes on the Parish of Llanthew," by the Rev. J. L. Davis.

On Wednesday week the objects visited were of exceeding interest. On the route, Mr. Rhodes, a resident at Pennoyre, entertained the archæologists to a *déjeuner*. After visiting a church and the residence of Giraldus Cambrensis, and a rest at Pennoyre, the party proceeded to examine a stone, called here maenhir— an upright, unhewn stone. When measured it was found to be between 12ft. and 13ft. high from the ground, and to average about 3ft. 6in. in diameter. There was much discussion here as to the origin and purpose of this stone.

Mr. Jos. **Joseph**, F.S.A., said there were three different theories with respect to these stones, which were found scattered about in different parts of the country. 1. That they marked a territorial boundary; 2. That they were intended to commemorate a battle or the interment of some person of note; and 3. That it was a place where Druids met for worship. He gave an instance of a stone on the boundaries of Glamorganshire and Breconshire used in an old document as a description of the boundary as when "leading up to Maen Gwydhir," *i.e.*, the stone of prayer. The date was of the time of Queen Elizabeth.

Rev. C. L. **Barnwell** mentioned a stone in Monmouthshire which was called the Stone of the Sun. He did not think this maenhîr was a stone of prayer. Many of these stones in Wales were associated with Arthur.

The Rev. R. **Price** (Brecon) thought this was a good deal a geological question, and that much would depend on whether the stone so raised was of the stone of the neighbourhood, or brought from a distance.

[The stone was red sandstone, of which there is a good deal in the immediate neighbourhood].

The next and most interesting point in the day's excursion was to Caer Bannium, about a mile west of the maenhîr. Here the Romans fixed their position in the year 54. The field is nearly square, and all round are the remains of the fallen walls, the rough stones being covered with corn and herbage. A few years ago the plough continually turned up Roman bricks, and some coins were found. At the south-west corner of the field was pointed out a junction of four or five Roman roads, leading in different directions, to Neath, Chester, Llandovery, and Carmarthen. A portion of the wall of the fortified part of the station, outside of which there must have been a considerable population living in villas, is still standing, and most perfect, and the concrete as hard as stone.

The Rev. E. L. **Barnwell** said this wall was of superior work to the wall at Silchester, and to the work at Carnarvon, Holyhead, and Caerleon.

Mr. **Rees** produced a map of Britannia Secunda, and pointed out the course of the Roman roads radiating from Caer Bannium. At least four Roman roads, he said, centered at this place. The fortified part of the Caer was 624ft. by 456ft., and contained an area of 6¼ acres.

The travellers then proceeded for about three-quarters of a mile from Caer Bannium along what is now a green lane pretty well sprinkled over with the ever blooming yellow gorse in uncut bushes of some age. There is the Via Julia Montana, which runs across Breconshire from east to west. The route is direct, and the causeway is visible here and there. At about half a mile or so from Caer Bannium is an upright stone by the side of the road, with two fresco figures of a Roman soldier and his wife, and an inscription only partly legible beneath. The words "conjux ejus," however, were made out, which would pretty well indicate the nature of the connection between the two figures represented. Nevertheless this stone is locally called "Maen Morwynion," which means the maiden stone, and the apology for the misnomer is that the figures were so badly executed that the Welsh mistook them for the figures of two females, and hence named the stone the maiden stone. As to the circumstances which could have led to the erection of such a stone by the side of the highway, Mr. Rees mentioned that in Pompeii they had found a street of tombs, tombstones being set up on each side of the road.

At the evening meeting Professor **Babbington** gave to those assembled at the Town Hall who were not present at the excursion an account of what had been seen, as described above. He alluded to the excellent state of preservation in which the ancient walls of Brecon had been kept, and suggested that they might be preserved without being "restored," in the manner in which the preservation of such antiquities had been effected in the north—viz., by lifting loose stones and placing cement between them without removing them from their places. He spoke of Llanthew Church, which had been visited early in the day, as a place of great interest in a deplorable state of ruin. The church consisted of nave, choir, chancel, and transepts, and he spoke of the necessity of reparation, but not "restoration," as interpreted by many modern architects. For instance, there were two corbels in the church here, which a mason coming to work would destroy. They were two images put there in the pre-Reformation period. We should not put such images in our churches now, but he did not like to see the evidence which existed of what had been destroyed. A few eminent architects—Sir Gilbert Scott, for instance—were very careful in this matter, and gave directions that anything manifesting an historical point connected with the building to be restored should be retained. Further describing the church, he said the transepts were in a dilapidated state. One was locked up, and was full of rubbish, tombs, &c. It had been shut off from the church itself. In the other transept two of three lancet windows had been blocked up. The nave was comparatively modern and uninteresting. There was a piscina in the chancel, and squints were supposed to have been originally in the building.

Mr. **Rees**, of Llandovery, recommended the establishment of a permanent museum in Brecon for the reception of numerous remnants of antiquity which were continually turning up in the country.

Mr. **Bloxam** made some remarks on the Roman masonry still visible there, and which he said was different to the earliest Anglo-Saxon masonry that he had found in Wales.

Mr. **Rees** afterwards read a paper on Clifford Castle and Llandovery.

A paper by Mr. Rowland Phillips, barrister, was also read by Mr. **Smith**, of Brecon. Its title was "Breconshire during the Civil War."

This being the last meeting to be held at the Town Hall,

Professor **Babbington** said it devolved on him as a member of the Association to return thanks to those gentlemen of the county and borough who had promoted so efficiently the meeting which they were holding. He did not know of any meeting of the Association which had been better attended than this had, so far as it had yet proceeded, and certainly no greater kindness had ever been shown to the members than had been shown in Brecon. He proposed a resolution of thanks to the local committee, the local secretaries, and especially to the mayor, as chairman of that committee, and to the magistrates for the use of that hall for holding their meetings, which was carried.

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BLACKPOOL MARKET COMPETITION.

FORTY-SEVEN architects sent in designs for this competition, and at a recent meeting of the Local Board it was decided that a competent architect should be engaged to go through the plans for the new market, to report to the Board what designs he considered most suitable for the purpose required, and also the most meritorious. In accordance with this resolution, the committee appointed for the purpose had communicated with Mr. James Green, of Portsmouth, near Todmorden, who has gone through the plans, and forwarded the report subjoined:—

Blackpool New Market, Board Room, Offices, &c.

Gentlemen,—Having, agreeably with your request, carefully examined the designs sent in competition for above, I herewith beg to give you my report thereon, with a view to the selection of designs for 1st, 2nd, and 3rd premiums, and such general remarks in respect of the whole of the large number of drawings submitted by the competitors, as occur to me necessary.

In considering the respective merits of the plans, I have been guided entirely by the instructions issued to architects, both as to the accommodation required and cost; and it is evident that a large number of designs must be at once excluded in consequence of their excessive cost, if for no other reason. Of these I may mention Nos. 6, 13, 19, 20, 22, 23, 32, 33, 34, 43, 44, and 46.

An equally large number must be rejected as having no merit whatever. In this class I include Nos. 1, 2, 4, 12, 14, 16, 25, 39, 40, 41, 42, and 47.

Out of the remaining designs I shall notice six especially for your consideration—viz., Nos. 5, 7, 17, 21, 29, and 36.

In considering the six designs I have no hesitation in recommending to your notice that of No. 7, bearing the motto "Mercurius," as worthy of the first premium, both on account of the arrangement of market, which is well lighted and ventilated, also shops and offices, and the excellent style of elevation it presents. I estimate the cost of carrying out this design in its integrity, including the handsome clock tower, would not exceed £7,500. The tower would absorb about £400 of this sum, but as it forms so great a feature in the design, and would be at once so useful and ornamental an acquisition to the town, I should strongly recommend the committee, if they decide to accept this design as the first, to carry out the whole as drawn.

For the second premium I select No. 17, bearing the motto "Knowledge is Power." This I name as having an excellent arrangement of plan, both of market and offices. The elevation I consider not so good, but the author has evidently considered the amount to be expended, and I think has not exceeded the amount in his design.

For the third premium I select No. 21, with the motto "St. Swithin," which has a much superior elevation to the last mentioned, but is not so good in plan, having less light and ventilation to the market, and not so convenient a board-room. I think the cost of this would not exceed £7,000.

Of the remaining three designs noticed, No. 5, motto "Practical," is a suitable one in many respects, both in plan and elevation, but it is open to the objection of having an open gallery or balcony over market as the only approach to the board-room and offices; and the board-room is disproportionate, being 74ft. by 20ft., and does not contain the area required.

No. 29, motto "Pro Bono Publico," is a good arrangement of plan, and has an excellent ventilation; probably the best of any designs, considered in a purely architectural view; but there is a serious oversight in the plan, no provision being shown or mentioned in description for carrying upper part of central tower. This, I think, is fatal to the design being a premiated one.

No. 36, motto "In the Hope to Win," presents many good features both in plan and elevations (Italian), but in making the building a perfect parallelogram the author has sacrificed space in the site, and consequently provided less accommodation. The nature of the design, being classical, would necessitate a more finished and expensive style of masonry, and would thus increase the cost over the others mentioned by £1,000 to £1,500.

Having now given you my views of the designs generally and separately, I have but further to add that I consider the one by "Mercurius" has been in all respects well considered by the author, who may get his second committee-room in the corner of first floor to West-street, in place of surveyor's office, if required.

Should you require any further information, or wish for a personal interview with me, I shall be glad to comply with the same at any time.—I remain, gentlemen, yours most truly,

James Green, C.E.

Messrs. The Chairman and Committee of the
Local Board of Health.

Portsmouth, near Todmorden, Aug. 22, 1872.

After the report had been read by the Chairman, Mr. W. Birch moved that the premiums be awarded according to the recommendation of Mr. Green, which was seconded by Mr. W. Read, and carried.

The following are the sets of designs submitted, and the mottoes under which they were forwarded:—No. 1, Honoris Causis; 2, Labore; 3, Consumatis; 4, Strive to Win; 5, Practical; 6, L'Esperance; 7, Mercurius; 8, 1872; 9, Utile Dulci; 10, Apropos; 11, Palmam qui meruit ferat; 12, Mark it; 13, Truth; 14, Devonian; 15, Let me Reflect; 16, Red and Blue Circle; 17, Knowledge is Power; 18, Union Jack; 19, Let there be Light; 20, Cotton; 21, St. Swithin; 22, Cotton; 23, Ad Valorem; 24, Utility; 25, Fylde; 26, Spero; 27, Face; 28, North Light; 29, Pro Bono Publico; 30, Thorough; 31, Ostendo non Ostendo; 32, Commerce; 33, Trefoil; 34, Trefoil; 35, Experientia; 36, In the Hope to Win; 37, Blackpool; 38, Pro Bono Publico; 39, Labore et Honore: 40, Industria; 41, Utility; 42, I serve; 43, The Claimant; 44, Palmam qui meruit ferat; 45, Adroit Quireur; 46, May Blackpool Prosper; 47, Ceci ne Vautrien.

It was resolved to award the premiums to—1st, £30, No. 7, "Mercurius," W. & J. Hay, Liverpool; 2nd, £20, No. 17, "Knowledge is Power," Charles O. Francis, Liverpool; 3rd, £10, No. 21, "St. Swithin," Thomas Bird & Son, Manchester.

"BUILDING NEWS" SCHOOL PLANNING COMPETITION.

WE beg to answer our correspondents in the order we have printed their letters:—

T.—The scale mentioned in instructions must be adhered to. The general school is intended for the assemblage of the whole department (220) at one time at opening and closing of school, or whenever it may be required for any other purpose, as distribution of prizes, &c., and this school-room for class teaching will only be required to accommodate the children for whom there is no provision in the four class-rooms. There will, therefore, only be one school-room and four class-rooms in each of the graded schools, as mentioned in the conditions. The Metropolitan Building Act or other Local Act must be adhered to. Competitors should state by which Local Act they elect to be governed. The fall of land does not affect the sewer. The arrows are correct.

T. P.—Caretaker's residence to comprise living-room, scullery and offices, and two bedrooms. There is to be only one drawing class-room, capable of accommodating 40 children, which is to be available both for the boys and girls.

Intending Competitor.— Double class-rooms mean two class-rooms capable of being thrown into one, so that there will be four class-rooms to each boys' and girls' school. Playground: You have evidently not worked out the quantity of the proposed site that the schools will require.

H.—The land has been carefully selected, and the area has been taken into consideration and arranged to meet the requirements of a school to accommodate the number of children stated in the conditions. As the schools are to be such as would be suitable for erection in a large town the price of land has also to be considered, and the object of the present competition is to provide a school which shall meet every requirement and yet be limited in cost. Such a piece of land as is here proposed is very often available in large towns.

F.—1. See the conditions. 2. The dimensions of back boundary line, omitted in the block, is 140ft. 3. The frontage of schools in cross street must be kept back at least to line of frontage of adjoining house. 4. Cross street is level. 5. Bell. Competitors are to use their own knowledge as to its necessity. Conditions are requisite only to give such information as competitors cannot do without.

M. C. H.—See the foregoing answer. The drawing-room must be capable of accommodating forty children. Caretaker's residence, see answer to T. P.

Competitor.—The rules of the Committee of Council on Education must be strictly adhered to.

X. Y. Z.—See answer to "T." For answers to other questions see the conditions.

J. S.—Must use your own discretion.

A. B. C.—1. The length of back wall omitted in block is 140ft. 2. Not a necessary question. 3. Given in instructions. 4. The school-room and class-rooms combined must accommodate the whole number. The individual accommodations of class-rooms and school-room is left to the consideration of the competitors. 5. The requirements of the Liverpool Local Buildings Act will suffice, but the Committee of Council's regulations as to thickness of walls, &c., must be strictly adhered to. 6. Left to option of competitor.

C. Brown.—See answer to "T."

X.—Must adhere to the rules of the Committee of Council. The buildings may be set back.

Edward A. Ould.—If you had worked out the schools you would have found it impossible to have put them on one floor. You may have as many floors as you think proper.

G. C.—We have pleasure in meeting the views of "G. C." and others, and therefore extend the time for the delivery of the drawings to the 30th November, 1872.

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WATER SUPPLY AND SANITARY MATTERS.

Exeter Local Board. — At a meeting of the Exeter Local Board on the 21st ult., a resolution was passed to the effect that the Sewage Committee, having declared that the sewage company had passed into liquidation, and otherwise violated the terms of the grant of the sewage on the 23rd August, 1871, the works constructed by the sewage company were become absolutely vested in the Local Board, and that the clerk and surveyor be directed to take the necessary steps for taking possession of them.

Trowbridge.—Mr. Tomlinson, engineer of the water company, has been gauging the springs at Bratton, to see if a sufficient supply can be obtained from that source. The result of his investigations will shortly be published.

Twickenham.—Twickenham's liability to a fine of £100 per day commenced on Friday last, the extended time allowed by the Conservancy Board having expired on Thursday. At a special meeting of the Twickenham Local Board of Health held the previous evening, Mr. E. H. Donnethorne, J.P., in the chair, the Board, after being informed by their legal advisers that the members themselves were personally liable for the penalty, carried the following resolution unanimously, viz.: "That the plans prepared by the surveyor, for the drainage of the parish, including the riverside embankment, be adopted, subject to the approval of Mr. Lawson (the engineer who had been consulted by the Board), and that the approval being obtained, the necessary steps be taken to obtain the requisite powers to borrow the funds required."

Building Intelligence.

◆

CHURCHES AND CHAPELS.

Bishopthorpe.—On Tuesday week the church at Bishopthorpe, near York, was reopened, after restoration. The seats are open, of pitch pine, and varnished. The ends are square, and pierced alternately with trefoils, quatrefoils, and Greek crosses, which have a good effect. Book boards are provided, and the sittings are broad and capacious, the benches reclining and comfortable for the congregation. The lectern, reading desk, and pulpit, are of oak. A new altar rail of oak has been provided, and an encaustic tile reredos by Mr. Knowles, of York. The church will accommodate 300 worshippers, being a larger number than before. The entire cost of the work is about £300. Messrs. Harrison & Co., of York, were the contractors, the architects being Messrs. J. B. & W. Atkinson, of the same city.

Dunkirk.—The parish church of Dunkirk, Kent, was reopened yesterday (Thursday) week, it having been closed several weeks for restoration. The edifice has been built only thirty-one years; but it appears that the foundation of the buttresses was found to be defective, and they have all been pulled down and rebuilt in cement. The old lead on the ridge of the roof has also been removed, and replaced by red ridge tiles. Internally, the organ and choir gallery at the west end has disappeared, and the organ is now placed in a new separate chamber, built out on the south side, forming a transept, with seats for thirty choristers. The chancel, which was quite plain, has been simply decorated by Messrs. Harland and Fisher. The old pulpit has been removed, and the former reading desk—a beautiful piece of carved oak, forming a model of S. Augustine's Tower — has been converted into a pulpit, and stands on the north side. The restorations have been carried out by Messrs. Goode and Payn, under the supervision of Mr. Broadbridge, architect, at a cost of £500.

Manchester.—Emmanuel Church, Barlow Moor-lane, was reopened by the Bishop of Manchester on Saturday last, after undergoing important alterations, comprising the addition of a chancel aisle and south transept, enlargement of vestry, the erection of an entrance at the west end, and the entire removal of the south porch and replacing the gangway by seats. The west gallery has been taken down, and the lower part of tower situated at west end of south aisle, and which formed the entrance to gallery, is now converted into a baptistry. Stained glass has been put in the west window by Hardman, of Birmingham. The inner vestibule is formed by a traceried screen of pitch-pine, glazed with cathedral plate of harmonious colours in geometrical lead lights. The original accommodation was about 500, which is now increased to 650—280 of which are free. The church is in the Decorated style of architecture, and built as recently as 1858. Messrs. Horton & Bridgford, of Manchester, are the architects; and Mr. Cardwell, of Altrincham, the contractor.

Sandford Orcas, Somerset.—The parish church of S. Nicholas, after being closed eighteen months for restoration and enlargement, was reopened on Thursday week by the Bishop of Bath and Wells. The whole of the church has undergone a complete restoration, and a new north aisle has been added. The chancel is of the fourteenth century, and has been carefully preserved; great attention has been paid in preserving the ancient character of the external masonry. The new work is in the Perpendicular style. The roofs are of pitch-pine, with curved ribs springing from carved stone corbels. The seats have carved bench ends; the pulpit and reading desk are carved and resting on Ham stone bases. Under the tower arch is an original oak screen of the Perpendicular period, which has been carefully restored. The manor aisle contains two stained-glass windows, by Clayton & Bell, and a new window by the same artists has been placed in the chancel by Mrs. Cookworthy, in memory of her mother, Mrs. Bayley. The work has cost about £2,000, and has been executed (under the superintendence of Mr. H. Hall, architect, Doughty-street, London, W.C.) by Mr. A. Reynolds, builder, of Milborne Port. The funds have been chiefly provided by the lord of the manor, Hubert Hutchings, Esq., and the rector, the Rev. Urquhart Cookworthy.

Wotton Fitzpaine, Dorset. — The parish church of this secluded hamlet, after long being in the most neglected state, has latterly been almost entirely pulled down and rebuilt, from the designs of Mr. George H. Birch, of London. Only the lower part of the tower remains of the actual structure, but a great deal of the old materials have been carefully worked in again, as far as possible, in the positions they originally held in the ancient building. The church in its plan consists of nave, chancel, and north and south transepts, with a vestry to the eastward of the north transept, and the Luttrell Chapel on the corresponding side of the southern one. The total length of the church from out to out is 76ft., the width of nave 20ft., and across the transepts 39ft. The height of the tower proper is 46ft. 6in., but a turret upon the north-east angle rises 5ft. higher, and will be surmounted by a vane which will add an additional 16ft. to the entire measurement. The upper part of the tower for a space of 15ft. is new, the rest being old. There is a good porch at the south-west end of the church. The style of architecture is mainly Decorated, the Luttrell Chapel only being Perpendicular. The font is Norman, and not uninteresting; it is octagonal in form; the bowl is plain, but there is an enrichment of some merit and interest upon the upper part of the stem, forming a capital for the bowl to rest upon. The arch between the chancel and Luttrell Chapel is old, so are the east and west windows, and the north and south chancel windows. They have ancient and quaintly carved heads stopping their labels, all of which are in good preservation. A large number of exceedingly interesting Early English corbels were found in the old walls during the progress of pulling down. These have been carefully preserved, and are re-inserted as corbels beneath the roof on the exterior of the chancel. The east and western gable crosses are of early date and character. They are good examples of the period, and have been refixed in their old positions, and so, also, has the old piscina. During the works the door which originally led to the rood-loft was discovered bricked up, and has been re-opened, together with an old squint upon the north side of chancel. The seating throughout is open and of deal, stained and varnished; the roofs, too, are of the same material. The Luttrell Chapel is divided from the south transept by a richly moulded arch in pine; the spandrels being filled with pierced tracery and the arch itself carried by corbels in Beer stone, beneath which are delicately carved angels in devotional attitudes. These, as well as the gurgoyles and other carving, are from the chisel of Mr. Harry Hems, sculptor, of Exeter, who has also made the reredos. There is a low chancel wall separating that part from the nave; this is about 3ft. high. The upper part is inlaid with tiles, the effect being good. The reredos is of Caen stone, the mouldings being very vigorous; it is neatly carved in the hollows with leaves of a trefoil type. The retable projects about 10in., and is composed of one slab of exceedingly beautiful Devonshire marble, moulded upon its edge, and running the entire length of the reredos. The central part over this is inlaid; there is a cross in the middle and on either side panels containing angels bearing scrolls, with the word "Alleluia" upon them. The mosaic, as well as the tiles in the chancel, are by Messrs. Maw, of Broseley. The altar table is of pitch pine, with an oaken top. The walls of the church are of flint, and the dressings of Ham Hill stone, from Mr. Charles Trask's quarries. The roofs are slated, capped by red ridge-tiles. The whole of the expense of the works is being defrayed by the Luttrell family, of Wotton Fitzpaine, and a stained glass window in memory of a late member of that family will be erected at the east end of their chapel. Mr. William Langford, of Lyme Regis, is the contractor for the whole of the works, which will be completed in a couple of months.

BUILDINGS.

Buxton.—The Congregational Sunday Schools here have just been reopened, after enlargement from plans furnished by James M. Monro, Esq., architect, Bath-street, Glasgow. The extension has been effected by the removal of the windows, and sub-masonry of one of the sides of the original building, the introduction of massive handsome iron columns for the support of the (three) arches; and the attachment of a new building to the former one, considerably exceeding the former one in size. The effect is to give one excellent room, or, by the addition of curtains at the intercepting arches, two smaller ones. The lighting of the new room, and of the centre of the old, is effected by a handsome cupola, with plaster mouldings, ventilator, &c., and two large end windows, the *tout ensemble* of the whole being admirable. Externally, the new buildings are constructed in careful harmony with the style of the church of which they form a part, itself a beautiful structure.

Earlsferry.—On Tuesday last the foundation stone of a new town hall for the burgh of Earlsferry was laid with Masonic honours. The architect of the hall is Mr. John Currie, Edinburgh.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the BUILDING NEWS, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

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☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

RECEIVED.—S. H.—J. W. T.—C. G.—C. F. H. & Co.—J. H.—A. S.—J. F. A. C.—T. G.—C. B. A.—J. O. L.—W. & Co.—J. A. C.

M. B. ADAMS.—The drawings to hand.

F. R. DAWSON.—The scale of the condition of the plans is of no consequence.

F. B. V., J. T., G. C., AND "AN INTENDING COMPETITOR."—You will see that your reasonable request, in reference to extending the time of the School Planning Competition, is complied with.

C. S. ADYE.—Drawing to hand.

JOHN LANGTON.—Drawings to hand.

Correspondence.

GREEK AND GOTHIC.

To the Editor of the BUILDING NEWS.

SIR,—I have only now seen Mr. Gildard's defence of Greek *v.* Gothic. Let me say that I am quite familiar with all he has advanced, and as great an admirer of the architecture of the High School, Royal Institution, as any Greek can be. All that he claims for Greek architecture as developing the beautiful in a style of construction so rudimentary I have already granted. There was no occasion for three columns of such ponderous artillery to prove that we cannot improve on the Doric of the Parthenon. It is Greek art in architecture alone with which we are concerned; and I say, alas for human genius if it is to be cribb'd, cabin'd, and confin'd by such a model. Its very perfection is its poverty, as far as its suggestive capacity for development is concerned, and makes it absurd to affirm that it has been neither rivalled nor surpassed. For Mr. Gildard reluctantly admits that human genius has done greater things since the age of Pericles in the art of construction and economy of material. I may add that greater things have been done in science, poetry, and mathematics, too (I shall add sculpture, for I have a presentiment that the New Zealander of 2500 A.D. will be found publishing his superlatives on discovering some fragments of a Glasgow statue). But if architecture of equal or surpassing beauty is produced with infinitely more of skill in the construction and adaptation of material, we have a higher style of architecture and a greater "achievement of human genius." On this admission I build without fear of contradiction a claim for the supremacy of Gothic, take it all in all.

Nor have I any fear of an appeal to authorities. Professional status has produced too many anomalies in the way of taste to make me at all anxious as to Mr. Gildard's. I shall not trespass on your columns by a dissertation on the advantages of anonymous correspondence, or ask sympathy for one overwhelmed by the announcement of the "high degree" of the Knight of the Parthenon. But, to use a seasonable phrase, I back Bartholomew against Gildard and Bartholomew's disciple Ruskin against Samuel Johnson. Mr. Hay's theory, like Burke's, goes down before an impartial collection of facts, and is as competent to produce the ugly as the beautiful. Does Mr. Gildard know that the angular or triangular hypothesis has been actually tried in this city of Edinburgh? The façade of Castle-terrace, with its lop-sided beauty, lacks every element of repose peculiar to the Greek, and as a costly specimen of the grotesque lacks also entirely the grace it might have had by study of natural forms instead of mathematical abstractions.

As to the proportions of the Parthenon, it is but one of many existing remains, no two of which agree in their design. Some specimens of Doric I am sure Mr. Gildard would pronounce clumsy. What sort of beauty there could be in pillars Parthenonically proportioned for York Minster I cannot conceive. I should certainly prefer the Gothic clustered pier. An unfluted Ionic pillar is the most graceless form conceiveble. The want of "bell" in the capital, or rather its lack of depth, is abhorrent to the eye; and Greek architecture of that order, as displayed in the National Gallery, here is, I hope, the last example we shall ever see. Even Mr. Thomson goes back for inspiration to the Egyptian, and happy as he is in his manipulation of the style, I must, at the risk of shocking Mr. Gildard, once more affirm that if this line of beauty were developed we we should have far too much of the sepulchre in our palaces; the beauty of repose would be too oppressive to be borne. But I have no fear of any such result, for the Gothic and the Classic arch will win and keep the field; and the recent improvements in Scottish Gothic Ecclesiastical Architecture, with all the accessories, will have happier results than Mr. Gildard has anticipated.—I am, &c.,

ANOTHER PROTESTANT AND ARCHITECT.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINS.

SIR,—As your correspondent "Plumber" still misunderstands my "trough junction," I will simply reply to the points he has raised. 1. He assumes gratuitously that my trough "is simply the putting in of an extra siphon-trap with a ventilating-pipe." He is wrong here. I have no pipe, and there is no "needless expense" in putting in an extra trap which "Plumber" fancies. As I explained in my former letter, my "trough" combines the siphon-trap, but where there is already the common trap, the "ventilating trough" only may be inserted between it and the soil-pipe. 2. "Plumber" asks "What is to hinder a simple, properly-put-in, and properly ventilated syphon-trap keeping back sewage-gas?" I answer "nothing." But how does "Plumber" propose to ventilate it? By a ventilating-pipe, I presume. Now, a ventilating-pipe may answer the purpose pretty well, but it is neither so efficient nor so economical as the ventilating trough I use. It has been shown also that a small pipe, by reason of the friction against its sides, does not afford such an easy passage for the gas as can be desired, and that the accumulation of gas in the upper bend of a siphon, or in any lead pipe, without easy and sufficient escape, has a corrosive action on it eating it away. In reference to "Plumber's" paper (p. 392 of BUILDING NEWS, Vol. XXII.), to which he refers, there is nothing in the plan shown, which is the ordinary method, which can make it so economical or efficient as the "trough." First, because there is no ventilating-pipe required in the latter; secondly, because my plan gives free escape for the foul air just where it is needed and accumulates; thirdly, because a separate ventilating-tube may often create a downward current, forcing the gas through the syphon, especially when the temperature or condition of the outer atmosphere is unfavourable to render it an up-cast pipe. 3. As I have before said, my "trough" is not so well adapted for soil-pipes placed in the centre of a building—a plan which no common-sense would tolerate. Another means I have published may be adopted in such cases. For further details of my "ventilating trough," &c., I must refer your correspondent to a work I am about bringing out on this and kindred subjects. I fear, however, the class which "Plumber" so ably represents will be slow to recognise any alteration or improvement in these matters.—I am, &c.,

G. HUSKISSON GUILLAUME.

BETHLEHEM AND BRIDEWELL HOSPITALS SURVEYORSHIP.

SIR,—In looking over your weekly issue as usual, I find a letter from a correspondent "J. H.," (p. 171), on the subject of the election of a surveyor to Bethlehem and Bridewell Hospitals which is entirely incorrect, and thinking you might wish to know the facts of the case, I beg to acquaint you with them. There were sixty applications for the appointment, from which the governors selected ten to meet them on Thursday, the 22nd inst.—viz., Aitchison, C. Barry, Christopher, Porter, Roberts, myself, Tarn, Torshod, Trollope, and Wallen, when the number was again reduced to five—viz., Barry, Christopher, Porter, Roberts, and Trollope. The running was entirely between Christopher and Roberts; the former had 22 votes and the latter 31, who was, of course, elected. Porter obtained 2 votes only and Barry 3.—I am, &c.,

ALFRED SMITH.

46A, Pall Mall, S.W. Aug. 31.

STOVES.

SIR,—I observe in your number of August 16 a description of the Galton stove, and as, as you say, the cost of fuel makes this question more important than ever, I write to describe one that I have used, not only in my own residence, but in many houses on which I have been engaged as architect, and which is a great improvement on the Galton stove, not only from the much greater amount of heat evolved, but in being complete in itself, and requiring no more setting than an ordinary register grate. It is called "Lewis's patent warm-air chamber fireplace," the manufactory being Providence Works, Stepney, Newcastle-on-Tyne, with a temporary show-room 3, Brownlow-street, Holborn. The cold air enters the air chamber at the back or underneath the fire, and can be brought from the external air or from any passage near at hand, and after being made to traverse the air chamber backwards and forwards by means of gills, comes out warm into the room, or can be conveyed into any other room or passage by means of pipes. The essential difference between this grate and all others I have seen, and in which I believe the patent partly consists, is that it is complete in itself, requires no air chamber building, and no more setting than an ordinary register grate.

I have these grates fixed in three sitting-rooms of my own residence, the cold air entering from and returning warmed into the hall. During the coldest weather of the severe winter of 1870-71, the hall and staircase three stories high were nicely aired when only one fire was lit. When two fires were lit they were comfortably warm, and when there were fires in all three sitting-rooms, the hall and staircase were as warm as the rooms themselves, and the bedrooms aired also; this result being obtained without using an ounce more fuel than if ordinary grates had been used, and the waste heat allowed to escape up the chimney.

One day, when the external air was 25° Fahrenheit, I tested the velocity and temperature of the air issuing from one of the air chambers (by means of Negretti & Zambra's standard thermometer, and Byron's delicate anemometers) about an hour after the fire was lit. I found the air going in near the hall door at 35° and issuing from the air chamber at the temperature of 130°, and at the rate of 140 lineal feet per minute, or 9 cubic feet raised 91°, or equal to about 82 cubic feet raised 10° in temperature a minute, and as the hall and staircase to be warmed contain about 7,000 cubic feet, it follows that when all three sitting-room fires are lit they can raise the temperature of the hall and staircase, &c., 20°, or say from 40° to 60° in an hour, after the fires are well burnt up. There is an entire absence of smoke, offensive smell, or oppressive dryness in the air.

To satisfy a friend whom I recommended to use them, I arranged not long since for a perfect testing by a scientific gentleman in a high official position who is well acquainted with all other stoves and modes of warming, and he reported most favourably on them.—I am, &c.,

F.R.I.B.A.

PLYMOUTH ARCHITECTURE.

SIR,—We were somewhat amused at the two letters in your last impression on the above subject, they contain so many inconsistencies. For instance—

With reference to the churches so much has been said of, "Three Towns" remarks, "There is little doubt that Mr. St. Aubyn's churches are immeasurably preferable to those erected by any Plymouth architect; indeed, if I except Mr. Reid's very fair church at Mannamead, I do not remember ever having seen or heard of a new church proceeding from a local architect's office." Now, I would ask how could they possibly fail to be so if no Plymouth architect had ever built a church?

Again, with respect to Mr. Keats' shops, your correspondent writes that they are "not of a more objectionable description than we see every day turned out by some of our best known architects in all large cities throughout the country." To use this gentleman's own words when speaking of "Plymouthian," "Two wrongs never make a right." Take away Mr. Hems' carving which I spoke of, and how much will Mr. Keats' architecture be worth? Seeing, with "H.," that there is very little worthy of the name of architecture in Plymouth, to distance the wretched buildings in the town is a very easy matter.

Now, we will see how "Plymouthian's" letter will bear a little criticism. He stated in his letter of 16th August, speaking of S. Paul's Church, "With the exception of the tower and spire, which are both stunted and had better have been left unfinished, I do not see that there could well have been any improvement." Now, one improvement that could have been made is pointed out. He says, "Remember, I have never said that S. Paul's was otherwise than 'ordinary.'" "Plymouthian" seems to resemble a weathercock very closely.

With respect to S. James's, "Plymouthian" wanders from the point. We never said anything as to the value of accessories, but merely stated the church itself was "very ordinary."

The reference to "classical prejudice" in connection with windows having their corners cut off is a good joke. Why not make use of the freedom of Gothic architecture, and place the windows upside down to get the doorway under? Moreover, this was not at all a "truthful necessity"; there are no buttresses to cut through, and as these doors are at the east end in the main street, and the "dirty back lane" at the west, we fail to see why they would be obliged to be placed there.

We may say to "Plymouthian," *tu quoque*, in reply to his remarks about Thanckes, as he refers to the church of Ottery S. Mary, near Exeter, whilst the former is just across the Tamar, and visible from Devonport.

"Plymouthian" says he has not seen Mr. Street's church at Torquay, yet he actually states that S. James's (minor) Church "will hold its own" with it, and another church he names in Exeter. Of what possible value can his statements be when he talks so absurdly. May I ask if he got his opinion from the "Ecclesiologist"?—I am, &c., QUATREFOIL.

VILLA AND SCHOOL PLANNING.

SIR,—Upon looking over the plans, &c., of your villa competition, it struck me that there ought to be some distinction as to architects in practice and assistants and pupils. It hardly seems fair for all to compete on the same conditions.—I am, &c.,

OBSERVER.

[It would be unnecessary, difficult, and invidious to make any such distinction. If such were made, as suggested by "Observer," some one else might with equal propriety ask us to make a distinction between architects without practice and architects with practice.—ED.]

SCHOOL PLANNING COMPETITION.

SIR,—Will you kindly inform me in the correspondence of your next issue, whether more than one story is permitted in the planning of the schools, as I do not think it possible to obtain the necessary accommodation in one flat.—I am, &c.,

York, August 28. EDWARD A. OULD.

SIR,—I think it would be advisable to extend the time for sending in the drawings for school competition, seeing that three weeks have been lost, as far as preparing the drawings are concerned, and in justice to the provincial competitors, who have to send the drawings away earlier. I should also suggest that the amended rules of the London School Board should be published along with the answers to the questions.—I am, &c., G. C.

[For answers to these and other questions, see p. 189. —ED. *B. N.*]

CANTERBURY CATHEDRAL AND PLUMBERS' WORK.

THE following letters appeared in the *Times* of yesterday :—

SIR,—More churches have been burnt by the plumbers' fires rolling out on to the gutters than from all other causes together. Again I take the liberty of citing what was done in the rebuilding of Doncaster Church. I had all the lead gutters laid on stone instead of wood, which had been specified as usual. It cost no more money nor involved the least difficulty. It would not cost much gradually to replace all the wooden gutters of the cathedrals with stone, and then such accidents would be impossible.—Yours obediently,

Rectory, Stevenage, Sept. 4. E. B. DENISON.

SIR,—The calamity which has befallen Canterbury Cathedral is not without precedent. On May 20, 1840, the south-west tower of York Minster caught fire, and the roof of the nave was destroyed, owing, it is believed, to the imprudence of a person employed in the tower. The estimated cost of repairs was £23,000. In 1561 the unrivalled spire of S. Paul's was burnt down, owing to the carelessness of a plumber, who had left a pan of coals burning while he had gone to his dinner. In some of the Mediæval statutes of our Cathedrals, and notably at Lincoln, provision is made for a careful watch over such workmen as a precaution against similar disasters. It would be well, again, to set such directions in use by the appointment of a member of the Chapter to overlook or to be responsible in times of restoration or repairs of roofs.—Yours, &c,

MACKENZIE E. C. WALCOTT.

SIR,—The fire at Canterbury Cathedral is said to have arisen from the same cause which has proved fatal to many of our old churches—namely, the system of repairing lead roofs and gutters by soldering defective joints of the lead covering. There is no excuse for this vicious system of patching; it is as faulty in principle as dangerous in practice. So long as lead on roofs and gutters is soldered, the expansion and contraction of the metal during changes of temperature will always cause cracks, and this system of repair must necessarily lead to leaky roofs.

The proper method of laying or repairing metal roofs and gutters is by allowing the metal free play to expand and contract, by means of overlapping joints; and until the cathedral clerks of works learn this fundamental truth they will never get rid of the plumber on the roof with his brazier of charcoal, and the constant danger of fire which follows this reprehensible practice.—Your obedient servant,

GEORGE WROTTESLEY,
September 4. Lieutenant-Colonel, R.E.

SIR,—I trust your remarks on the burning of our historical monuments may have the effect of directing public attention strongly to the dangers to which our old mansions and churches are exposed from the firepots of our workmen when repairing the roofs.

Most of the old mansions and churches have been destroyed in the same way, and it is a lamentable thing to reflect that unless some precautions be taken and enforced we can calculate with tolerable accuracy when the survivors will follow.

It is, however, in my opinion, quite idle to hope for safety from any amount of supervision, unless additional mechanical aids are given to the workmen to perform their work with safety, as the work has frequently to be done under conditions involving considerable danger.

I speak from experience, as I had ample opportunity of studying the way in which these fires are caused while restoring Lalmeck Castle, the flat roofs of which necessitated an extensive use of zinc and lead, and, consequently, of plumbers and their men. Not being the architect, but merely the owner of the place, I confess I felt a lively interest in the proceedings of men carrying about iron pots with blazing fires over my roofs, and often in a high wind, and I confess I felt much more surprise that the building so often escaped than when it was eventually set on fire.

The ordinary operation is as follows:—The workman carries up a cauldron filled with charcoal, and places it near him on the roof. As the charcoal is somewhat difficult of ignition, he generally provides himself with a bundle of shavings or thin wood, which he places in the cauldron, and then applies his lucifer match. The result is that the wind—which at such an elevation is generally strong—blows the blazing shavings or light wood mixed with charcoal dust over the roof, and as it is quite impossible for the workmen to follow and extinguish the scattered combustibles, the latter lie quietly smouldering where they fall—sometimes for hours, or even days.

Sometimes the workman accidentally upsets the cauldron, as there is frequently no room for him or it to stand with safety. Sometimes—indeed generally—the cauldron is left during the night upon the roof, after the workman has, as he thinks, extinguished the charcoal.

The sequel is well known, and within the last month we have had several examples of the results. In the night a strong wind springs up, the smouldering embers are fanned into flame, and if the woodwork be uncovered, or if there be planking or other timber near the roof, generally, the building is gone in the morning.

Now, Sir, the remedy for all this is surely not far to seek.

All that is needed is to put into the hands of the workman a firepot, which will do no harm even if upset, and which will not allow the ignited shavings, wood, or charcoal, to fly about and smoulder in secret places.

This can be easily effected by providing the firepot with a simple gauze cap, in which it must be placed before taken on to the roof, and with an aperture in the gauze for the insertion of the soldering iron.

All we have to do is to adopt the principle of the Davy lamp, and to insist that no firepot on any pretence shall be carried without such a gauze guard.

The same arrangement would apply to the gluepots of the carpenter and joiner, and to every vessel or lamp in which fire or light is carried about by workmen.

There is, of course, a certain repugnance on the part of workmen to use any appliances by which danger may be lessened; but a few years' penal servitude imposed upon those who burn down our priceless monuments from recklessness would probably lessen this repugnance and give the owners some security.

I have mentioned the matter to both architects and plumbers, and they seem to approve the remedy as simple, inexpensive, and effective.

I find the cost of such a wire guard would be about two shillings.

3, Hare-court, Temple. E. AUBREY MORIARTY.

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On Monday Messrs. Walker & Ackerley offered for sale the Theatre Royal, Birkenhead, with 3,533 square yards, the residue of the land belonging to the Birkenhead Theatre Company, Limited, extending from Argyle-street to Henry-street. The land was divided into two lots, containing 1919 and 1614 superficial yards respectively, but for neither of these lots was there any bid. The next lot was the Birkenhead Theatre and shops, containing altogether 1652 superficial yards, for which an offer of £6,000 was made, but as this was far beneath the reserve bid, the property was withdrawn.

Intercommunication.

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QUESTIONS.

[2643.]—**Puzzolana.**—How and of what is artificial puzzolana made?—R. L.

[2644.]—**Party Wall.**—Rule 1 of section 85 of Metropolitan Buildings Act recites: "No building owner shall, except with the consent of the adjoining owner, or in cases where any party structure is dangerous (in which cases the provisions hereby made as to dangerous structures shall apply), exercise any right hereby given in respect to any party structure unless he has given at the least three months' previous notice to the adjoining owner." In the event of the Metropolitan Board of Works requiring the demolition of a dangerous party wall, can neither owner build a new party wall without giving the three months' notice? If so, the obstinacy of one owner may be a grievous injury to the other. It is to be noted that the provisions relating to dangerous buildings appear to apply only to the pulling down of party walls, and not to their re-erection, and therefore authorises a person under notice from the Metropolitan Board of Works to pull down a dangerous wall to comply with the Board's notice without giving notice to the adjoining owner. Again, in the event of a fire destroying a party structure dividing two houses of different owners, one of which owners does not desire to rebuild, it would appear by the Act that he can keep his neighbour's premises exposed and uninhabitable for three months by not allowing him to dispense with three months' notice before rebuilding. I should be glad to receive the opinion of some of your readers as to the possibility of an owner placed in the above circumstances, and wishing to rebuild, being entitled legally to proceed without so long a notice as three months.—R. L.

[2645.]—**Architectural Dictionary.**—Can any of your correspondents inform me of the largest and most copiously-illustrated dictionary of architecture and building (next the "Dictionary of Architecture"), and what the subscription to the Royal Architectural Museum (if any) is, or how conducted?—H. B.

[2646.]—**Cleaning Brickwork.**—I am doing some ornamental brickwork, gauged arches, &c., in front of new buildings. The late heavy rain has beaten on the scaffold boards and discoloured the face of the work. The bricks are Birmingham red, smooth face and hard, and are laid in white mortar. Can you or any of your kind readers inform me the best way to clean the above? Washing with water softens the joints.—W. W.

[2647.]—**Keeping Out the Damp.**—Will some one tell me of a method for keeping out the damp in the following instance? I have a room, the floor of which is 3ft. below the level of the ground on the outside. The wall is built of 9in. brickwork.—O. P. Q.

[2648.]—**Dimensions of Arches.**—Will some of your readers be kind enough to inform me if there is any method of ascertaining the dimensions of groined or other arches, in order to prepare a drawing of the same to scale, which arches are, by reason of their great height or otherwise, inaccessible for measuring with the rod?—G. A. C.

[2649.]—**Masonry.**—What is known by circle upon circle—that is, turning an arch over a circular plan? Practical masons, and also many foremen that I know, have failed to dispose of this problem in a systematical way; in fact, they have wholly failed to work it out in a proper system. I have known the arch stones put in rough and worked out by templets, twisting zinc, &c., and depending greatly upon the eye, with the joints wrong, and so forth; in fact, done altogether wrong and unmechanically. If a brief elucidation of this difficult question would not be trespassing on your valuable space, we should be thankful for the edification.—E. L. S.

[2650.]—**Timbers for Building Purposes.**—Will some reader oblige by naming a work on the various timbers used for building purposes?—COUNTRY JOINER.

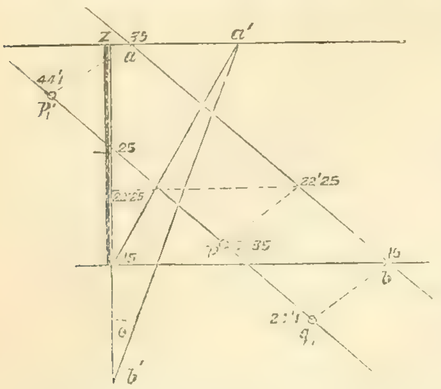
[2651.]—**Architrave.**—I should feel obliged if some one would kindly inform me the difference between double face architrave and single face architrave; and as they are paid for at per foot superficial, the length by the girth. A small sketch of each, showing where girth should be taken, would oblige, as it is a matter of dispute.—T. W. J.

REPLIES.

[2635.]—**Pettenkofer's Process for Restoring Pictures.**—I believe Von Pettenkofer's process consisted merely in exposing the pictures to the vapour of alcohol at the ordinary temperature of the air, the picture being placed in an air-tight box, at the bottom of which is a tray containing alcohol. The object was to remove the cracks so often observed in old pictures, but the method has failed in many instances. Dr. G. J. Mulder, who has devoted a considerable amount of attention to the matter, is of opinion that the only effective preservation of pictures is complete exclusion of the air. The real cause of the ultimate destruction of pictures is the gradual but continuous oxidation of the dried paint, resulting in the crumbling to powder of the pigments.—KAPPA.

[2636.]—**Kaolin Bricks.**—I think Messrs. Martin Brothers, of Plympton, were the first to make bricks from the refuse of Kaolin or China clay, mixed with quartz sand carefully selected and washed. They consisted (approximately), on analysis, of 75 parts of silica, 22 of alumina, 2 of peroxide of iron, and 1 of alkalies, waste, &c. Their high refractory power is due to the small quantity of iron they contain.—DOWLAIS.

[2622.]—**Geometrical**.—The problem as it now stands is absurd. If the points p_1 and q were anything but 44·1 and 24·1 respectively, the line could not be parallel to the given plane. This is shown clearly below. This can be proved in many ways; but first



and simplest let us change the numbers on the scale of the plane from 15, 25, 35 to 10, 15, 20 respectively, then the original line will be parallel to this new plane. But it is also parallel to the original plane—*i.e.*, the same line is parallel to two different planes—which is absurd.—J. T. J.

[2637.]—**Hardening Gypsum Marble or Stucco.**—The oldest method is by mixing the burnt gypsum with lime-water or a solution of gum arabic. Alum and water (20oz. of the former to 6lb. of the latter) is also good. Gypsum thus mixed is known as "marble cement." "Parian cement" is gypsum hardened by means of borax, 1 part of borax being dissolved in 9 parts of water, and the gypsum heated with the solution. An addition to this solution of 1 part of cream of tartar is said greatly to improve it.—DIOMEDE.

[2638.]—**Barracks.**—In 1858, when prizes were offered for the best designs for infantry and cavalry barracks, Mr. Wyatt obtained that for the latter. The synopsis used by him was from the Blue Book containing the Report of the Committee on Barrack Accommodation in the Army, with the Minutes of Evidence, date 1855. See also Spon's "Dictionary of Engineering," p. 249.—R. S. T.

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LAND AND BUILDING SOCIETIES.

CONSERVATIVE LAND SOCIETY.—On the 7th of September the Conservative Land Society enters upon its 21st year. Since its formation in 1852, the services of the same chairman (Viscount Ranelagh), the same Vice-Chairman (Edward Brownlow Knox), and the same Secretary (Mr. C. L. Gruneisen), have been secured for the society, which during the period it dealt in land—up to September, 1868—invested in estates in 26 counties, which were allotted to the amount of £625,560. Thousands of persons of all classes of the community have thereby acquired freehold land and houses. The £50 shares taken out have been Nos. 37,617, representing a subscribed capital of £1,880,085, and under the certified rules the withdrawal privilege of investors has been exercised to the extent of over £485,000.

THE STAFFORDSHIRE LAND, BUILDING, AND IMPROVEMENT COMPANY.—The final meeting of the shareholders of this company was held on Monday week, when Mr. N. Joyce, the liquidator, presented his report and statement of accounts, which were unanimously adopted. In three months the company will be dissolved.

THE NORTH KENT PERMANENT BUILDING SOCIETY.—The sixth annual general meeting of this society was held on Monday last, at Gravesend, Mr. W. Newman in the chair. The report states that the society is making steady progress; ninety shares have been taken during the year; subscriptions received during the same period, £810 5s.; withdrawals, £635 9s. 2d. The amount advanced during the year has been £1,310, and the repayments have amounted to £762 15s. 2d. The total amount advanced during the six years' existence of the society has been £9,200, of which £4,028 17s. 8d. has been repaid, and the repayments continue satisfactory. The balance-sheet attached to the report shows that after paying expenses, there is a balance of £121 19s. 7d. available for distribution. A dividend of six per cent. was declared.

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NEW HARBOUR FOR JERSEY.—The foundation-stone of a new harbour for Jersey was laid on Thursday week. The works comprise a breakwater on the west, and a landing pier on the east of the present harbour, to enable the mail packets to land passengers at all states of the tide. The estimated cost of the undertaking is £254,000, and it is to be carried out under the direction of Sir John Coode, who was engaged on the Portland Breakwater.

Our Office Table.

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BUILDING WITH BITUMEN.—Last week, Mr. J. L. Norton, the inventor of a new process of building walls and constructing pavements, &c., with bitumen, exhibited the process at Blackfriars-street, Manchester. A sort of rough mould was constructed of boards, between which the wall was to be built. The bricks were laid inside, and as each layer was laid down the melted bitumen was poured into the narrow spaces left between. The bitumen cools in a very short time, and then becomes much harder than ordinary mortar or cement. In addition to the advantages already mentioned, it is stated that a house in the building of which it is used is perfectly habitable the moment it is finished, as no settlement takes place, and no dampness proceeds from the bitumen, which is dry as soon as it cools.

VANDALISM AT STIRLING.—The Town Council of Stirling, which not so very long ago was literally shamed out of turning Wallace's monument into a public-house, are about to perpetuate as disgraceful a piece of Vandalism as it is possible to conceive. Sir George Harvey, the painter, states that a portion of the beautiful walk which runs up the south side of the town is fringed with a most picturesque group of basaltic trap, covered with natural herbage. Certain members of the Council are desirous of disposing of this for the purpose of a common quarry; and the Council, by a majority of 12 to 9, have agreed to the proposal. The net income from this quarry is estimated at £12 10s. annually!

OPENING OF THE PENICUIK RAILWAY.—The first passenger train has been run on the new Penicuik line of railway. The line has been engineered by Mr. Thos. Burrell, C.E., and has been under the inspection, while in course of formation, of Mr. John Leslie, C.E. Extensive and convenient sidings for the various manufactures have been devised by Mr. John Buchanan, C.E., and the whole works (with the exception of the station buildings, erected by Mr. J. Tait, Penicuik) have been constructed by Mr. John Waddell, Bathgate.

SUGGESTED NEW METHOD OF DECIDING COMPETITIONS.—A correspondent of the *Scotsman*, in reference to the designs sent in for the proposed Cathedral at Edinburgh, says:—"It seems to me that there are only three methods by which a question of mingled science and taste can be satisfactorily decided by persons who have no special education fitting them for the task. 1. They may refer it to a single individual of proper qualifications, such as, for the sake of example in the present instance, Mr. Ruskin or Mr. Fergusson. I do no press this course, however, because I am not architect enough to know whether either of these gentlemen may not have expressed views which would render one or other of the competitors averse to accept his authority. 2. The question might be submitted to a body of men specially trained in an artistic sense, such as the Royal Scottish Academy, with instructions to state which of the designs, in the opinion of the majority, would prove most artistically effective in the proposed site. 3. But if, in lieu of these methods, the opinion of the general public is to be taken for guide, it ought at least to be that of competent and responsible persons, and ascertained in some definite manner. It would not do to admit of a general ballot by all visitors to the Exhibition, for this would give an unfair advantage to those whose friends might muster most strongly, and notably to the Edinburgh competitors over the strangers. But I think the result might be attained if the trustees were to address to a number of leading Scotsmen, not only of those resident in Edinburgh, but of those within reach of it, and also to any English or foreign visitors of whose presence they might be aware, circulars requesting them to state in writing, in the order of their preference, the three designs which they considered superior. If the consequence was not the selection of the best design, it would at least be the selection of the design which, in the opinion of the majority of persons of some culture, seems the best; and this is perhaps the nearest approach to a satisfactory conclusion which we can hope for." This method would probably give as little satisfaction as is the case when vestries and local boards decide on the merits of competitive designs.

WATER-COLOUR PAINTING.—Mr. Edwin Dolby calls attention to what is, as he says, a serious evil, and one which, unless at once remedied, threatens the very existence of water-colour painting in this country. Owing to false economy, or to the use of deleterious chemicals in the manufacture, the paper supplied has ceased to possess the necessary qualities for the production of good water-colour painting. Sheet after sheet has to be discarded before the artist can find a satisfactory one, and even then he cannot count upon the picture standing for any length of time.

SCARBOROUGH UNDERCLIFF COMPETITION.—The Scarborough Cliff Bridge Company offered £100 for the best, and £50 for the second best plan for laying out the Undercliff recently purchased by them. Messrs. Stewart & Bury, of Scarborough, architects, took the first premium, and Mr. Oldfield, of London, the second.

LIVERPOOL AUTUMN ART EXHIBITION.—The second Liverpool exhibition of the works of modern artists in oils and water colours, was opened to the public at the Library and Museum, in William Brown-street, on Monday last. Nearly 1,000 works in oil and water colour are exhibited, notwithstanding that 500 have been rejected, partly for want of merit, and partly for want of room. The number of works in in oil hung is about the same as last year, but in water-colours there is a larger show.

SOCIETY OF ENGINEERS.—At noon on Friday last a large body of the Members and Associates of the Society of Engineers met at Westminster-bridge pier, and went in the Greenwich boat to Cubitt Town, whence they embarked in small boats, in which they crossed to the opposite bank of the river, and there spent several hours, under the guidance of Mr. J. Pye Smith, inspecting Messrs. Ransome's artificial stone works, and Mr. Bessemer's new steel works, all at Greenwich. Mr. Perry F. Nursey, the secretary to the society, attended and pioneered the party. In the evening the visitors dined at the Trafalgar.

DOVER HARBOUR.—The Dover Harbour Board have decided to adopt Mr. Hawkshaw's plans for deepening and extending the harbour, and making other improvements, at a cost of £200,000, so that passengers may land and embark at all hours of the tide. At the same time Mr. Bessemer is said to have perfected his plans for a class of vessel which will do away with oscillation, and so prevent sea-sickness, and which has the further merit of not requiring any extension of harbour accommodation on either side of the channel.

PRECAUTIONS AGAINST FIRE IN PARIS.—The public buildings in Paris are at present being supplied with large water-tanks on or immediately under the roof, in order to be prepared for any sudden outbreak of fire. The National Library in the Rue de Richelieu, the Bank of France, and the Bourse, have already been provided with reservoirs holding several hundred cubic yards of water. Others are now being placed at the Louvre and the State Rooms of the Hotel Drouot, whilst the various Ministries, the Beaux Arts, the Conservatoire, the Luxembourg, and the new Hotel de Ville, will all possess a similar mode of protection.

EXETER CATHEDRAL.—A correspondent says:—The work of restoration is progressing satisfactorily. Messrs. Clayton & Bell's decorators have finished the enrichment of the roof, and left Exeter a couple of weeks ago. The ribs are Decorated, and the bosses, of which there are a very great variety seen from the ground, come out exceedingly well now that they have been gilded and picked out with colour. The decoration of the ribs, however, is not nearly so successful. The white dots upon a vermilion ground in the hollows, presumably in resemblance of ball flowers, have a flat, poverty-stricken appearance about them, as disappointing, in a proportionate degree to the visitor, as is the painted fan tracery on the roof of Milan Cathedral. The ground of the spandrels between the ribs is left without decoration; this gives a steaky appearance to the whole roof, very different from the beautiful and rich effect produced at Worcester, where the spandrels are filled with ornament. Mr. Edwin Light Luscombe, of S. Lidwell's, Exeter (the contractor for the works under Sir G. G. Scott, R.A.), is pushing the rest of the works on with great vigour. Mr. Long is the very courteous and obliging foreman of works.

BRISTOL CITY SURVEYORSHIP.—A joint committee of the Bristol Town Council has decided to recommend the appointment of Mr. Josiah Thomas as city surveyor, at a salary of £700, with an allowance in addition for a horse and trap. Mr. Thomas will be allowed to retain his private practice, but must not undertake any work in which the interests of the parties concerned are antagonistic to the Corporation. The staff required by Mr. Thomas will be appointed by the committee.

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JERSEY.—A window by Messrs. Ward & Hughes, of London (the subject of which is the Good Shepherd) has lately been placed in S. Brelade's Church, Jersey, to the memory of the Rev. William Braithwaite.

CHIPS.

The Bishop of Salisbury has consecrated S. Peter's Church, Portland, erected entirely by convict labour from designs furnished by Major Du Cane, R.E. The church will accommodate 522 persons, and has semicircular-ended transepts.

An Exhibition of Modern Works of Art will be opened at the Royal Manchester Institution on the 11th inst.

The inauguration of the Davy Monument at Penzance will take place in about three weeks' time.

The Dudley Town Council has decided to carry out certain alterations at the Town Hall, which will include the erection of two towers.

S. Giles's Church, Reading, which is now undergoing restoration, will be reopened on the 24th inst.

The foundation stone of a new church at Llanthony, Abergavenny, for Father Ignatius, took place on the 22nd ult. The choir and nave of the new church (the portions which have now been undertaken) will be erected at a cost of about £3,500.

Mr. John Knowles, of Herne-hill, has given £1,000 to the S. Paul's Completion Fund.

The Prince of Wales has intimated that he will not be able to comply with the request of the Aberdeen Town Council to lay the foundation-stone of the new breakwater.

A subscription has been opened to erect at the Ecole des Beaux-Arts a monument to the memory of Henri Regnault, the painter, and the students who were killed during the war.

The time of the BUILDING NEWS School planning competition is extended to the 30th of November, 1872.

A new bridge at Medley, Oxford, in lieu of the ferry, has been commenced. Mr. W. Ogden, of Walton-street, Oxford, is the contractor.

The site of the new Portishead Docks, Bristol, has been marked out by flags.

A new process of building walls and constructing pavements, &c., with bitumen, has been exhibited at Manchester.

The principal inhabitants of Nenagh, and the railway company, have notified their intention of discontinuing the use of gas, and substituting oil lights, in consequence of the gas company having given notice of raising the price of gas to 10s. 10d. per 1000ft., from the 1st September.

At the quarterly meeting of the Canterbury Diocesan Church Building Society a grant was made in aid of the new church at Folkestone.

The remaining portion of the old pier at Herne Bay is now in course of removal.

A new church is to be erected at Rugeley, and a committee has been formed to secure plans and a site. The bulk of the funds are provided by legacy.

Mr. Hector Horeau, a French architect, has just died at the age of 71. He had quite a collection of gold medals which he had won, and plans of which he was the author that brought fame and fortune to other men of his profession. One of these medals was obtained in London, in 1850, for a plan for an Exhibition building in Hyde Park.

The work of restoring Hartshill Church, Stoke-upon-Trent, is now fairly commenced, and it is hoped to be completed by the end of November.

A Committee of the Bath Town Council has been for some time past engaged in settling the preliminaries connected with the erection of a lunatic asylum for the borough. The estimated outlay is £20,000.

The Local Board of West Ham district have determined to erect the necessary appliances for testing on a large scale General Scott's lime and cement process for treating sewage.

More than a quarter of a million sterling is to be expended in providing the island of Jersey with a good harbour.

The important works at Illingworth Church, which has been closed for restoration since last month, are now on the point of completion, and the church will be reopened on the 25th inst.

On the motion of the Marquis Townshend, the Guardians of S. George's, Hanover-square, are considering the possibility of making the baths in their casual wards available for the use of poor persons not in the workhouse.

Mr. Flintoff delivered a lecture on Tuesday evening to a meeting at Exeter Hall, convened by the London Gas Consumers' Association, upon the subject of cheap gas for the metropolis. He urged that the gas-lighting for the metropolis should be placed in the hands of the parochial authorities, as had been done in about sixty of the chief provincial cities and towns. Where this step had been taken, the price of gas was now little more than half the price paid in London.

There will be a united meeting of the Leicestershire Architectural Society, and of the Architectural Society of the Archdeaconry of Northampton, at Lutterworth, on the 10th and 11th inst.

Trade News.

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TENDERS.

CHATHAM.—For the supply of 200 tons of broken granite, for the Chatham Local Board of Health:—

Mowlem & Co. (accepted)......... 11s. 4d. per ton.

CHATHAM.—For the supply of granite kerbing, for the Chatham Local Board of Health:—

Mowlem & Co. (accepted)......... 1s. 4d. per yard.

CHATHAM.—For the supply of broken rag, for the Chatham Local Board of Health:—

Stokes (accepted)......... 5s. per yard.

FORDEN.—For alterations to the workhouse, Forden, Shropshire:—

Davies (accepted)......... £4400

GRIMSBY.—For the erection of twenty-eight cottages at Grimsby. Mr. David Dick, architect, Kent House, Grimsby:—

Bricklayers' and Masons' Work.

Enderby & Sons	£3804
Waller	3752
Riggall & Hewins	3612
Moody & Co. (accepted)	3388

Carpenters' and Joiners' Work.

Brown	£2702
Coulson & Heywood	2464
Snowdon & Topham	2380
Nottingham	2380
John Benton	2044
Morley	2016
Chapman & Jaggers	1938
Joseph Benton	1846
Betts & Betts (accepted)	1806

Palisading.

Charlton	£245
Moss	196
Drewery (accepted)	182

LEICESTERSHIRE.—For the erection of Baptist Chapel and schools at Melton Mowbray, Leicestershire. Mr. F. T. Mercer, architect, Bedford. Quantities supplied:—

Hobson & Taylor	£1847	0	0
Dean	1843	0	0
Barnes	1689	0	0
Chapman & Waite	1645	0	0
Hayes	1613	4	11
W. & H. Clarke	1433	9	3

LONDON.—For alterations and repairs to No. 8, New Cavendish street, Portland place, for S. B. Clark, Esq. Messrs. Goulty & Gibbins, architects. Quantities supplied by Mr. J. C. Lansdown:—

Colls & Son	£960
Scrivener & White	908
Stephens	889
Watson Brothers	856
Brown	780

LONDON.—For the erection of a warehouse on Dyer's Hall Wharf, London Bridge, for the Monument Warehouses Company. Messrs Eastman & Son, architects. Quantities by Messrs. Franklin & Andrews:—

Lucas Brothers	£39900
Higgs	39228
Myers & Sons	39200
Macey	38584
Webster	37610
Little	37340
Colls & Sons	36790
Coleman	36550
Hill, Keddell, & Waldram	36480
Axford	36300
Rider & Sons	36200
Browne & Robinson	35879
Anscombe	35240
Elkington	33600
Crockett & Dickinson	30490

The wrought-iron joists to be supplied by the proprietors, in addition to the above.

LONDON.—For the erection of new cattle lairs, Caledonian-road, entrance of the Metropolitan Cattle Market. Messrs. Lander & Bedells, architects. Quantities supplied:—

Mansbridge	£2651
Williams & Son	2559
Mann	2537

LONDON.—For the erection of new hall and almshouses for drovers, to be built at the Metropolitan Cattle Market. Messrs. Lander & Bedells, architects. Quantities supplied:—

Warne	£4009
Dove Brothers	3670
Ryder & Son	3568
Ebbage	3563
Jay	3515
Williams & Son	3468
Grover	3347
Axford	3275
Mann	3193
Mansbridge	3040

ROEHAMPTON.—For addition to infants' school, Roehampton. Mr. F. Chambers, architect. Quantities not supplied:—

Dawson	£835
Gibbs	752
Nye	729
Grover	718
Aries (accepted)	700

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES [illegible] with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application. Offices and Show Rooms, 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

COMPETITIONS OPEN.

DEVIZES, October 9.—For designs and estimates for an Odd Fellows' Hall and Institute.—Mr. W. H. Hill, The Green, Devizes.

GRAYS THURROCK (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

KINGSTON-UPON-HULL, September 16.—For designs for two chapels, and an entrance-lodge, to be built in the proposed new cemetery on the Hedon-road. A premium of £20 will be given for the approved design. —Mr. C. S. Todd, Clerk to the Local Board, Town Hall, Hull.

KINGSWINFORD SCHOOL BOARD, October 1.—For a design for school buildings to accommodate 800 children, with class-rooms, master's and mistress's houses. Premiums of £10 for the best and £5 for the second best designs.—Mr. J. L. Holberton, Clerk to the Board, High-street, Brierley Hill.

OBAN, September 12.—For designs for a new church. A premium of £25 will be given for the most suitable design.—Mr. James Nichol, Banker, Oban.

THE ROYAL NORTHERN AGRICULTURAL SOCIETY (DWELLINGS FOR AGRICULTURAL LABOURERS), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

ADMIRALTY (Whitehall), Sept. 24.—For Downton's pumps and water-closets.—Mr. F. W. Rowsell, Superintendent of Contracts, Admiralty, Whitehall.

BLAKENEY NATIONAL SCHOOLS, September 9.—For the erection of the Blakeney National Schools.—Messrs. Midland & Son, Architects, Clarence-street, Gloucester.

BOARD OF WORKS (Westminster District) Sept. 11. —For paving, making, and repairing the carriage-ways and footways within this district.—Mr. E. Hollis, Clerk to the Board, 25, Great Smith-street, Westminster, S.W.

BOARD OF WORKS (Hackney District), Sept. 12.—For the supply of 500 yards of best blue Guernsey granite. —Mr. J. Lovegrove, C.E., Surveyor to the Board, Town Hall, Hackney.

BOLTON, September 13.—For the erection of a new Wesleyan Chapel with school-rooms beneath, at Bolton, near Bradford.—Messrs. T. H. & F. Healy, architects, Tyrrel-street, Bradford.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner Land and Works, Victoria, British Columbia.

BROWNHILLS (near Walsall), September 14.—For the erection of a police-station and cells.—Mr. R. Griffiths, Architect, Martin-street, Stafford.

CASTLISLAND RAILWAY COMPANY, September 28. —For the construction of the proposed line from Gortallea to Castlisland.—Messrs. Cotton & Flemyng, 3, Harcourt-place, Dublin.

CITY, September 9.—For the purchase of the building materials of the premises 31 and 32, Throgmorton-street, and 12, 12A, 13, 14, and 15, Copthall-court, E.C. —Messrs. J. & E. Burford, Surveyors, 20, Throgmorton-street, E.C.

COVENTRY, September 9.—For the erection of Spon-street Schools.—Mr. T. H. Kirby, Clerk to the Board, Coventry.

DARLINGTON, September 25.—For erecting and finishing a fever hospital.—Mr. G. G. Hoskins, architect, Northgate, Darlington.

HUDDERSFIELD, September 24.—For the ammoniacal liquor made at the Corporation Gas Works.—Mr. J. Burgess, Engineer and Manager, Gas Office, Leeds-road, Huddersfield.

LEEDS, September 10.—For the erection of six houses and four houses in Brookfield-street, Hunslet-road.—Mr. J. Charles, Architect, Leeds.

LIVERPOOL CENTRAL STATION RAILWAY, September 17.—For the supply of steel rails, chairs, fish-plates, bolts, &c.—Mr. E. Ross, Secretary, London-road Station, Manchester.

LEEDS, September 16.—For the erection of a Wesleyan Chapel and school at Woodhouse Carr.—Mr. G. F. Danby, Architect, 31, Cookridge-street, Leeds.

LONDON (S. Giles), September 20.—For the supply of stone for paving, and gravel, sand, ballast, &c.—Mr. W. J. Treharne, office of the Board of Works, 199, High Holborn.

LONDON AND NORTH-WESTERN RAILWAY, September 18.—For the construction of a new passenger station at Batley.—Mr. S. Reay, Secretary, Euston Station.

MARKET DRAYTON, September 30.—For repairing the highways.—Mr. George Gordon Warren, Clerk to the Highway Board, Cheshire-street, Market Drayton.

METROPOLITAN BOARD OF WORKS, September 26.—For the construction of a Portland cement concrete sewer, about 300ft. in length, and other works near Hammersmith Bridge.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

METROPOLITAN BOARD OF WORKS, October 3.—For the construction of engine and boiler-house, chimney, coal-vaults, reservoirs, dwelling house, wharf-wall, and extension of low level sewer, westward to the Chelsea Embankment, with other works for the Western Pumping Station, to be erected on a site in Pimlico.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

METROPOLITAN BOARD OF WORKS, September 26.—For the construction of about 11,135ft. of brick sewers.—Mr. J. W. Bagalgette, Engineer to the Board, Spring-gardens.

MIDLAND RAILWAY, September 9.—For the erection of additional offices at Derby.—Engineer's Office, Midland Railway, Derby.

NORTH-EASTERN RAILWAY, October 3.—For the construction of a bridge, and alteration of the Stockton and Norton-road.—Mr. C. N. Wilkinson, Secretary, York.

NORTH-EASTERN RAILWAY, October 3.—For the construction of the Melmerby and Masham Branch Railway.—Mr. C. N. Wilkinson, Secretary, York.

ORMSKIRK, September 13.—For alterations and enlargements at the Ormskirk Workhouse.—Mr. Wm. Parr, Clerk to the Guardians, Ormskirk.

RIVER WEAR COMMISSIONERS, September 10.—For the erection of proposed chain-cable and anchor-testing establishment at the South Dock.—Mr. T. G. Morris, Clerk's Office, Commissioners' Quay, Sunderland.

ROCHESTER SCHOOL BOARD, September 18.—For the erection of proposed new schools at King-street, Troy Town, Rochester.—Mr. R. Prall, Town Clerk, Clerk's Office, Rochester.

ROSS, September 16.—For the erection of new school buildings, children's and officers' apartments, infirmary, vagrant-wards, &c.—Messrs. Haddon Brothers, Architects, Hereford.

SHEFFIELD SCHOOL BOARD, September 25.—For the erection of public elementary schools at Walkley, Crookesmoor, Grimesthorpe, and Attercliffe.—Messrs. Innocent & Brown, Architects, 9, S. James's-row, Sheffield.

SKIPTON, September 23.—For the erection of the Skipton Parish Church Schools.—M. J. Varley C.E., Architect, Swadford-street, Skipton.

SOUTH WALES MINERAL RAILWAY, September 14.—Foa the construction of a branch railway, about two miles in length.—Secretary, Welsh Freehold Coal and Iron Company, 109, Bishopsgate-street, E.C.

STOCKPORT, September 10.—For the supply of glazed earthenware sanitary pipes, stench traps, and other sanitary goods.—Mr. W. Hyde, Clerk to the Local Board, Stockport.

TRINITY HOUSE, September 9.—For the purchase of about 27 tons of worn chain-cable, and about 6 tons of old buoy-chain.—Mr. R. Allen, Secretary, Trinity House, E.C.

TRINITY HOUSE, September 9.—For the construction of sea defences at the Orford Low Lighthouse.—Mr. R. Allen, Secretary, Trinity House, E.C.

TUNBRIDGE WELLS, September 27.—For the erection of stables, cart-sheds, and two cottages for workmen.—Mr. W. Brentnall, Town Surveyor, Town Hall, Tunbridge Wells.

UPPINGHAM, September 9.—For the construction of about 400ft. of 18in. pipe outfall sewer, about 1,000ft. of 9in. pipe to distributing-carriers, filtering-chamber, and shed, and for trimming and laying out about 15 acres of land.—Mr. W. Wales, Clerk to the Chairman, Uppingham.

WAR DEPARTMENT CONTRACTS, September 11.—For the construction of a brick hut, for quarters for two staff captains, and separate servants' accommodation, in W. Lines, South Camp, at Aldershot.—Royal Engineer Office, Aldershot.

WAR DEPARTMENT CONTRACTS, September 11.—For the execution of works and repairs to the barrack and hospital buildings, &c., at Woolwich, and to some buildings occupied by the Army Reserve Establishment in Greenwich, from 29th September, 1872, to 31st March, 1876.—Colonel W. D. Gossett, Royal Engineer Office, Woolwich.

WAR DEPARTMENT CONTRACTS, September 13.—For an iron roof of 100ft. space, with wood skylights, and the labour in fixing wood purlins, boarding, and laying slating at the Royal Engineer Field Works Depot, Chatham.—Colonel J. W. Lovell, Royal Engineer Office, Chatham.

WEAR NAVIGATION COMMISSIONERS, September 10.—For the supply of 700 loads Baltic timber, 20,000 superficial feet Redwood deals, 11 by 4, and 20,000 superficial feet Redwood deals, 11 by 3.—Mr. J. G. Morris, Clerk's Office, Commissioners' Quay, Sunderland.

WOODLESFORD, September 11.—For the erection of eleven houses.—Mr. W. Wilks, architect, 9, East Parade, Leeds.

WOOLWICH UNION, September 12.—For supplying and laying the fire-mains, hydrants, fire-cocks, and fittings in connection with the Workhouse Infirmary—Mr. E. B. Sargent, Clerk, Union House, Plumstead.

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Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.

		£	s.	d.	£	s.	d.
Pig—Foreign	per ton	£19	15	0	£19	17	6
„ English W.B.	do	20	10	0	21	15	0
„ Lead Co.	do	21	10	0	0	0	0
„ Other brands	do	19	0	0	20	5	0
Sheet Milled	do	21	5	0	21	10	0
Shot, Patent	do	23	5	0	0	0	0
Red or minium	do	23	5	0	0	0	0
Litharge, W.B.	do	0	0	0	0	0	0
White Dry	do	27	10	0	0	0	0
„ ground in oil	do	0	0	0	0	0	0

COPPER.

		£	s.	d.	£	s.	d.
British—Cake & Ingot	per ton	£100	0	0	£103	0	0
Best Selected	do	100	0	0	105	0	0
Sheet	do	104	0	0	110	0	0
Bottoms	do	108	0	0	112	0	0
Australian cake	do	97	0	0	103	0	0
Spanish Cake	do	98	0	0	0	0	0
Chili Bars, cash	do	90	0	0	93	0	0
„ Refined ingot	do	94	0	0	103	0	0
Yellow Metal	per lb.	0	0	8¾	0	0	9¼

IRON.

		£	s.	d.	£	s.	d.
Pig in Scotland, cash	per ton	£6	4	3	£0	0	0
Welsh Bar, in London	do	13	0	0	13	10	0
„ Wales	do	12	0	0	13	5	0
Staffordshire	do	16	0	0	16	15	0
Rail, in Wales	do	11	10	0	13	0	0
Sheets, single in London	do	20	0	0	24	0	0
Hoops, first quality	do	17	0	0	18	0	0
Nail Rod	do	16	0	0	16	10	0
Swedish	do	16	10	0	17	0	0

OILS, &C.

		£	s.	d.	£	s.	d.
Seal, pale	per tun	£39	0	0	£40	0	0
Sperm body	„	85	0	0	0	0	0
Cod	„	36	0	0	0	0	0
Whale, South Sea, pale	„	38	0	0	0	0	0
Olive, Gallipoli	„	46	10	0	47	0	0
Cocoanut, Cochin, tun	„	37	10	0	38	0	0
Palm, fine	„	38	10	0	38	15	0
Linseed	„	36	5	0	36	10	0
Rapeseed, Eng. pale.	„	39	5	0	39	10	0
Cottonseed	„	32	10	0	32	15	0

TIMBER.

		£	s.	d.	£	s.	d.
Teak	load	£14	10	0	£15	10	0
Quebec, red pine	„	3	15	0	5	0	0
„ yellow pine	„	3	15	0	6	0	0
Quebec oak, white	„	6	0	0	6	5	0
„ birch	„	2	10	0	5	0	0
„ elm	„	4	10	0	5	0	0
Dantzic oak	„	3	15	0	6	0	0
„ fir	„	2	10	0	4	0	0
Memel fir	„	3	5	0	4	0	0
Riga	„	3	10	0	3	15	0
Swedish	„	2	5	0	2	10	0
Masts, Quebec red pine	„	4	0	0	6	10	0
„ yellow pine	„	4	0	0	6	10	0
Oregon	„	7	0	0	9	0	0
Lathwood, Dantzic, fm.	„	5	0	0	7	0	0
„ St. Petersburg	„	9	0	0	10	0	0
Deals, per C., 12ft. by 3 by 9in.,							
Quebec, white spruce	„	14	10	0	20	0	0
St. John, white spruce	„	13	10	0	14	10	0
Yellow pine, pr reduced C							
Canada, 1st quality	„	20	0	0	22	0	0
„ 2nd do	„	14	0	0	15	0	0
Archangel, yellow	„	12	10	0	14	10	0
St. Petersburg, yellow	„	12	0	0	13	5	0
Finland	„	7	10	0	8	10	0
Memel and Dantzic	„	0	0	0	0	0	0
Gothenburg, yellow	„	8	10	0	11	0	0
„ white	„	8	0	0	9	0	0
Gefle, yellow	„	10	10	0	13	0	0
Soderham	„	8	10	0	12	0	0
Christiana, per C., 12ft. by 3 by 9in., yellow	„	10	0	0	12	10	0
Other Norway	„	8	0	0	9	0	0
Flooring boards, pr square of 1in., first yellow	„	0	10	0	0	11	6
First white	„	0	9	0	0	10	0
Second qualities	„	0	6	6	0	9	0

BANKRUPTS.

SITTINGS FOR PUBLIC EXAMINATION.

November 19, F. Mason, Walworth-road, tobacconist, and Crouch-end, builder.—November 6, D. A. Chudleigh and H. Daniel, New City Chambers, Bishopsgate-street, timber merchants.—September 25, H. J. Norfor. Yarmouth, builder.—September 18, T. Simmons, Newhaven, builder.

SCOTCH SEQUESTRATIONS.

James Crawford, Glasgow, joiner, September 11, at 1.—John Drummond, Edinburgh, painter, September 9, at 2.—Andrew Wedderspoon, Partick, near Glasgow, joiner, September 9, at 12.

PARTNERSHIPS DISSOLVED.

Glaister & Bulman, Whitehaven, builders.—George Lambert & Son, Leeds, builders.—Wood & Thorpe, Queensbury, near Halifax, monumental masons.—Harding & Goodway, Banbury, plumbers.

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THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 389, published September 6, 1872, contains Articles on:—The Equatoreal—Its Use and Adjustments; The Museums of London.—III.; Reviews; Chemical Nomenclature; Hot-Water Heating Apparatus; The Spheroidal State of Water and Boiler Explosions; Lunar Meteorology; Mechanism; Preserved Meat, Condensed Milk, and Extracts of Meat; The Aims and Instruments of Scientific Thought; British Association Gleanings; Moonrise—Telescope Stops—The Earth's Interior—Elongations of the Inferior, and Oppositions of the Superior, Planets—Mira Ceti, and Algol—Height of Mountain—Clock Rate—Roundabout Theory—Lunar Motions—57 M. Lyræ—Specula—Purchase of an Object-Glass—and a Few Full Moons in advance; The Solar Corona; The August Meteors; Comparing Electro-Motive Forces; Wall Transit Instrument; Lunar Meteorology; A Giant Planet, &c.; Sun Spots; Ornamental Turning.—XIV.; The Cheap Observatory Clock; The Parallelogram of Forces; Adjusting Mainsprings; Spinning Tops and Gyroscopes; Properties of the Gyroscope; Death of the Crank; Bee Management.—Feeding; Bees and Beehives; Tuning Keyed Instruments; On the Disregard of Theory Frequently Shown in the Construction of the Opera or Field-Glass; Radius of Surface of Object-Glass; Economy in Using Coal.—Stoves; Screw Cutting; Auroræ Boreales and Gales; Greenhouse Heating; The Washington Spherical Rest; Calculating Wages; Marine Aquarium; Boiler Incrustation; Our Mathematical Column; Coal in Ireland; "English Mechanic" Turners' Society; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents, &c. Published at the Office of the BUILDING NEWS, 31, Tavistock-street, Covent-garden, W.C.

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Information relative to the Society may be obtained of the collector, Mr. Alfred Hill, 16, Bancroft Hospital, Mile-End-road; or of

JOHN TURNER, Hon. Sec.

15A, Wilton-street, Grosvenor-place.

BUILDERS' BENEVOLENT INSTITUTION.

The TWENTY-FIFTH ANNUAL DINNER in AID of the FUNDS of the CHARITY will be held at Willis's Rooms, S. James's, on Thursday, 7th November. Edwin Lawrence, Esq., President of the Institution, will take the chair. Gentlemen desirous of promoting the interests of the institution by becoming stewards will be pleased to forward their names to the treasurer, Geo. Pucknett, Esq., 258, Gray's-inn-road, W.C.; or to the secretary, at the office, 4, Vernon-place, Bloomsbury-square, W.C.

A. G. HARRIS, Sec.

September, 1872.

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ROYAL POLYTECHNIC.—UNDINE (written by H. S. Leigh), with splendid optical, spectral, and water effects. Music by Arthur Sullivan and E. Frewin, Scenery by Messrs. Gordon and Harford. Twice daily at Four and Nine.—PROFESSOR GARDNER, on ALE, BEER, and GIN; what they are, and what they ought to be! with experiments and samples of adulterations.—CURIOSITIES OF OPTICAL SCIENCE, by Mr. King, with new Mystical Sketch, and startling illusions.—MONT CENIS and its Tunnel, with VESUVIUS IN ERUPTION, by Mr. King.—GARTO, the DEMON OF MUSIC; and many other amusements. Admission to the whole, 1s. Reserved seats, 2s. 6d., 1s and 6d. Open twice daily, at twelve and seven.

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THE BUILDING NEWS.

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LONDON, FRIDAY, SEPTEMBER 13, 1872.

SOME NOTES ON CIVIL ARCHITECTURE IN THE YORKSHIRE TOWNS.

THE Gothic style seems to be steadily winning its way into the affections of the inhabitants of Yorkshire, though the type adopted is of but moderate excellence. It is somewhat coarse and wanting in refinement, yet this is partly due to the nature of the stone employed, and partly to harmonise it with its surroundings, and in anticipation of the discoloration due to a few years' exposure to the smoky atmosphere. As far as mere simplification of detail is concerned, this might tend to its advantage, but the character we have noticed extends to the treatment of the masses and their sky-line, and is often regretably startling and confused. It is to be hoped that the laudable efforts of the zealous antiquarians and archæologists of the county, who are in great force, may tend to make the fine old examples of Mediæval work, freely scattered through the locality, more appreciated. Mr. Sharpe's excellent remarks upon the stately but constrained grace of the Cistercian abbeys in their lovely dales cannot fail to call attention to their contrast in this respect; and from the judicious remarks we have heard in many quarters, we are disposed to think that the prospect of Gothic architecture for the future in these parts is hopeful. All movement seems to be in this direction, and though, of course, buildings are still rising in the Vernacular or mongrel Italian, they escape censure amid indifference, and find no party to defend them. We think, at least we may aver, that it would now be thought quite as absurd that any important civic building should for the future be erected in the Classic fashion, as it undoubtedly has long been with regard to Ecclesiastical buildings, and though the tide has not yet set so markedly in the same direction for private undertakings, there are many indications of the probability of its doing so. Sir G. G. Scott's works at Leeds have had time to lose their freshness in its smoky atmosphere, and though their refinement of detail is conspicuous amid the native productions, and has done good service in the education of public taste, the inhabitants are seeking for something beyond them, and Mr. Norman Shaw's work in the neighbourhood is giving them a taste of better things. At Manchester Messrs. Waterhouse & Worthington still lead the way, and by the scale and boldness of their works—though it must be owned not by harmony of detail, or ability in the handling of the graceful style they have selected—are doing great service in popularising Gothic. Huddersfield, since our last visit, has, as one enters it from the station, put on a Mediæval dress from the hands of Mr. Crossland. A large block of offices for the Ramsden Estate is a striking pile in a prominent position, and the architect has wisely abstained from giving it the character of a single public building, which it is not. It is open to criticism in many points, mere shopfronts being too much glorified with moulded and cusped arches, which would be more at home in cathedrals. Still, the whole is a work to be thankful for. Far better, however, is a smaller unfinished building, we believe from the same hands, immediately behind the block we have named. Its purpose is apparently to serve as shops and warehouses, and recalls the vigour of the ancient examples of this class in Cologne and other German cities. The projecting oriel at the angle is excellent, particularly in the lower part, its stem and corbelling; the upper part is, however, weak in comparison. Another Gothic block of buildings is a clubhouse, and is vigorous and effective, though somewhat too pretentious, which is a usual fault of the day. At Brighouse, Mr. Swinden Barber's new church of S. James deserves notice, but in the domestic branch there is only one villa by Mr. G. J. Nicholl, which is, unfortunately, in general exterior form, somewhat ungainly, and, therefore, unlikely to become attractive. Yet, in spite of some misplaced cusping and other details, it is characteristic, though severe, and by its comfort and accommodation, and many good and novel points within, it may win for the style a good name in practical matters.

Bradford, perhaps, is making most play for the moment in the direction we have been indicating, but it is in quantity rather than in quality. Its new Town Hall and several other buildings, of considerable though less size and importance, are effective, and the manner in which they group together is picturesque. They cannot, however, be recommended to the architectural student in search of purity of detail. It is no fault of the architects, Messrs. Lockwood & Mawson, that the site for the Town Hall is so completely in a hole; it is to be regretted, however, that they have not in some degree lifted their building out of it. Economy could hardly be the excuse, as the cost of a basement might have been spared with advantage out of the over-ornate detail of the exterior. Some hundreds of blank shields in panels, for instance, might be dispensed with, unless heraldic distinctions linger longer in Bradford than elsewhere. As our readers are aware, the general design is imitative of that of Mr. Burges for the Law Courts, and though it would be unfair to judge the model by the copy, the similarity in the first-floor windows is so great that it is well for those who affect, as so many do now, the same proportions, that they should come here and judge of the result for themselves. The preponderance of the arches and squatness of the columns, and disproportion between their shafts and capitals, would, we think, dispose few to repeat the experiment. The tower at present promises well, and its richly recessed coupled belfry windows on each side, though familiar from many French church towers, is worth repetition. We trust that this feature will not be spoiled by excess of projection and fussiness of cornicing and gabling, which have ruined all the completed pinnacles beneath. If we recollect rightly from the plan, it was requisite to advance the porch from the main building to get length for the principal staircase; otherwise, considering the narrowness of the street in which the principal façade is situated, it would have been better if less prominent, for in perspective it hides from each end one-half of the frontage, and this is a point which might be borne in mind with regard to the Law Courts and other similarly placed structures. The other buildings in Bradford to which we have alluded are of the more ordinary type of Victorian Gothic, greatly needing reformation, but calling for no special remark. The untoward weather has compelled us to restrain our researches elsewhere within very narrow limits, and we can only speak of Mr. Shaw's work at Leeds, which we have named, an orphanage in the suburbs, from hearsay, but as, in this journal we have recently illustrated his thoroughly characteristic house at Harrow Weald, and as we are told that this other example is fully worthy of its architect, we feel that we have not exaggerated its probable influence upon the future architecture of Leeds, where such things are thoughtfully discussed and fully appreciated. During a lucid interval of this waning, sobbing summer we managed to inspect Mr. Crossland's church of S. Chad, near Leeds, executed for Mr. Beckett Denison, a work of great but not transcendent merit. It has a fine tower and spire, somewhat too much for the rest of the fabric, which seems to need a prominent chancel to correspond, but has only an apsidal termination to nave and chancel comprised under one roof. The detail is bold but coarse; the boldness is commendable, seeing the unkindly nature of the stone, but the coarseness unnecessary. This latter is observable in the want of proportion between the double chamfers of the window-openings and section of the mullions, which is too deep for its width, and gives an awkward character to the tracery. The aisle windows are too sharply pointed and large, and heavy corbelling under the eaves of the aisles, and the absence of any to the main structure, are grave inconsistencies. On the same route may be seen a remarkably picturesque and pleasing Gothic villa, built for his own residence by Mr. Corson, of Leeds; but some atrocious ones in the distance by a Mr. Armley seemed to be examples of what to avoid, which we did by at once retracing our steps. In Leeds itself but few additions of note have of late been made to its architecture; but from what we learn more may soon be expected, and it is likely that the character it has hitherto maintained will not be forfeited. We shall, therefore, watch its development with interest, and hope to notice it upon some future occasion.

NOTES ON EARTHWORK.—XVI.

THE embankments constructed along the foreshores of the sea and of the estuaries of rivers, for the purpose of reclaiming land from the encroachments of the tidal waters, form an important part of the subject of Earthworks. The soil of this kind of land is for the most part rich in organic remains and other fertilising matter, and almost immediately after enclosure yields large crops of vegetation. It is estimated that there are at least 500,000 acres of land yet reclaimable from the encroachments of the sea, in England and Ireland, the average value of which, soon after its enclosure, would be £40 per acre. If we make a very extreme estimate of the cost of reclamation, and say that it would be £20 per acre, we may see how an addition of ten millions sterling to the national wealth of the country may be made by labour, directed by engineering skill—for earthworks, judiciously devised, are all, or nearly all, that are required. The reclamation of land consists essentially of three operations—(1) the embankment, with its appurtenances of sluices, by which the tidal waters are shut out from the area to be reclaimed; (2) the drainage of the land after it has been embanked; and (3) the reclamation proper of the soil so enclosed and drained. It is the first and second portions of the subject with which we are concerned, the third being an agricultural operation.

Mr. James Oldham, of Hull, an engineer of very extensive experience in works of this character, says, in a paper read at the Institution of Civil Engineers, that in determining the sectional form and area of the bank, the engineer must be guided by the height which will be necessary to prevent the possibility of an overflow, the situation in relation to the character of the waves rolling on to the works, and the nature of the materials to be used in the construction. Where the outer face is exposed to a heavy rolling sea the slope must be very gradual, so as to prevent a heavy surge and disturbance of the face of the works; and if the earth used in the construction of the bank is of a light and sandy nature, it is necessary to give an extensive base to the bank, and an easy and gradual slope. In many situations considerable allowance must be made for settlement of the materials. When these are of a light and loose character it is necessary to carry up a puddle wall in the centre of the bank, so as to prevent leakage through or under the bank. "If a slip takes place in any part of tidal embankments, great care must be observed not to allow any fascines to be used, as there is always a danger and liability of faggots forming conductors for water." In order to preserve the outer or sea face of the bank against the action of the water it is desirable to face the slope with sods bearing the marine grasses. "These sods should be cut from 4in. to 6in. in thickness, and be well beaten into a regular form. On the top and on the land side of the bank the fresh-water grasses will soon grow after the completion of the works, and, therefore, it is not necessary that those portions of the bank should be covered with turf in the first instance."

The author describes the works of an embankment at the mouth of the river Humber made by him for enclosing about 700 acres of new land. The part of this bank which had to encounter the rough storms of the Humber was made of an average height of 7ft. 6in., the greatest height in any part being 8ft. 10in., with a top width of 4ft. The outer or sea face was constructed with a slope of 5 to 1, and the inner face of 1½ to 1. Along the inside of the bank a drain was excavated at a distance of 6ft. from the foot of the slope; its average width is 10ft. at the top, and its depth is from 4ft. to 6ft. 6in.

In constructing the banks the contractor was required to use the soil excavated from the drain, and the remainder was to be taken from the ground outside the bank, but under the restriction that no excavation was to be made there within 6ft. of the foot of the bank, or to a greater depth than 4½ft. In order to prevent the danger of a slip of the slope of this excavation, on the side next the bank, the slope was to be not less than 2 to 1. Within about three or four years of the completion of the works the excavations outside the bank were silted up to the general level of the land by tidal deposits.

In carrying on the works gangs of men were set on at several places along the line of bank, so as to raise the bank at these places fully to the height of ordinary spring tides, but the principal natural creeks were left open for the escape of tidal water. The creeks were afterwards filled up simultaneously, and the whole embankment was brought to one level at the full height.

The nature of the soil of which this bank is made is such that it consolidates and unites into a mass perfectly compact and impervious to water; no puddle wall, therefore, was required in this case. The settlement was 15in. in the highest part of the bank (8ft. 10in.), which was partly due to the consolidation of the material of the bank, and partly to the subsidence of the ground on which the bank rests.

Mr. John Paton, in a paper read at the Institution of Civil Engineers on the sea-dykes of Schleswig and Holstein, says that generally the inner slopes of the dykes, or banks, have an inclination of 1½ to 1. The outer or sea slopes vary considerably, being, where not much exposed, 3 to 1, but where they are exposed to the sea 6 to 1, or more. The width of the top is there generally greater than in England, because, the land lying low, the tops of the dykes are used as roads, and are about 8ft. or 10ft. in width in the smaller dykes, and from 10ft. to 20ft. in the larger ones. Generally, the banks have an outer slope of 3 to 1 from the top down to a level about 10ft. or 12ft. over ordinary flood level, and below that a flatter slope of from 8 to 1 to 15 to 1, according to circumstances of position with respect to exposure.

In fixing the width of the top and the slopes of the bank, consideration has to be given not only to its position, but also to the quality of the material to be used, which consists, Mr. Paton says, sometimes of clay, and at others of moor or bog earth. The best material, he says, which can be used for the dykes, is clay mixed with sand. "Clay alone, without intermixture with sand, easily bursts after exposure to the rains, or dries suddenly by excessive heat." Common soil is frequently used, and is considered good, though not equal to the sandy clay, as moles, rats, and foxes, can more readily make passages through it. Where good materials cannot be procured in sufficient quantities for the formation of the dyke, it is customary to cover the water slope with clay, several feet in thickness, and if the material is fine sand or bog earth both slopes are covered with clay. In other cases, also, where dykes are made of sand, or earth, it is necessary to fill up the interior with clay, laid a considerable depth in the ground, as experience has shown that the water will, without this precaution, sometimes find its way through the ground, and issue behind the dyke. The slopes are covered with grass sods, 6in. thick, and 1ft. square, which form an important feature in the Schleswig dykes, and every care is taken to improve the growth of this grass, no plants or trees being allowed on the banks. Where excavations are made for materials near the bank they are not cut in a direction parallel with the current, or in connection with one another, small banks being left between the excavations, to prevent the formation of a stream from a sudden influx of water. The earth for the bank is always taken from the outside of the dykes when it can be done, but where circumstances require it to be excavated from the inside a cess is left of 50ft. in width, or more, between the foot of the bank and the edge of the excavation. In concluding his remarks Mr. Paton considers that "the true test of successful engineering enterprises is not so much the perfection of the gigantic works which have been raised up as monuments of skill, but rather the benefits they have conferred upon mankind. If reclamations from the sea are judged by this standard, the advantages are incalculable . . . . and no other engineering works are of more paramount importance, or have conferred greater benefits on the world." The surface of marsh lands actually recovered in Denmark—or what was Denmark—and protected by the dykes, is about 900,000 acres. During the professional engagements of the author in that country he became impressed with the skill and judgment which have been manifested by the construction of these works. "From the earliest times the descendants of the great Vikings have gone on, amid difficulties and perils, year after year, century after century, with unabated zeal and untiring energy, adding to the security and extent of their lands, converting them from desolate tracts into rich and fruitful corn-fields."

Mr. John Henry Muller (of the Hague) read a paper at the Institution on reclaiming land from seas and estuaries, in which he says that the soil of the land to be reclaimed may be divided into four distinct classes; thus, between the old sea bank and the edge of low water, the first breadth, proceeding from the shore, is a salt-marsh, of clay, about the level of ordinary spring tides; then samphire ground, slake, or mud, or rich alluvial matter, as far as the line to which the water reaches at half-tide; next, hard sea sand; and lastly, near low-water mark, quicksand. In choosing a line for the embankment, the character of each of these different kinds of ground must be regarded. To construct the bank on the salt marsh, where the ground is clay, is the easiest, and on samphire ground and mud the most difficult. In constructing a bank on this kind of ground slips are of constant occurrence, the use of waggons and horses is impossible, and a large proportion of the material is washed away as fast as it is deposited; in fact, for waste, settling, and contingencies, from 60 to 100 per cent. more than the net quantity of material of the bank must be calculated upon as necessary. When the line of the embankment is at half-tide level, or about the limit of vegetation, and on hard sand, it is possible to make the whole of the reclaimed land fit for cultivation, and this mode of effecting the enclosure need not cost more, and is safer, than when the higher, but softer, bottom is adopted as the seat of the bank. When large areas at this level are to be reclaimed, it is sometimes considered necessary to run out from the shore "cradge banks" so as to reduce the extent of water to be contended with in constructing the sea-bank, but that practice, Mr. Muller thinks, is erroneous, as the difficulty in the construction of the sea-bank does not increase with the area to be reclaimed, but depends upon the relative widths of the openings left for the passage of the water during the construction of the bank. The author gives two instances from his own practice in illustration of this. In reclaiming a piece of land of 1,000 acres by a bank three-quarters of a mile in length, the seat of which was 6ft. below the level of high-water, only one opening of 7 chains in width was left (154 yards). In another case, in reclaiming 1,700 acres by a bank 4 miles in length, the seat of which was 8ft. below high water, three openings, respectively 5, 7, and 12 chains in width, were left. In neither case was the speed of the outgoing current materially increased during the progress of the works. In reducing these openings, however, and finally closing them, the current in passing out became violent. Closing these openings that have been left for the passage of the water in and out during the construction of the main portion of the bank being acknowledged on all hands to be one of the most difficult operations of sea embanking, we will mention several methods of doing that part of the work that have been adopted in various places, but must previously refer to some remarks of Mr. Muller on other parts of the work. Banks, he says, on a lower level than that of half-tide mark are not advisable, on account of the shifting nature of the bottom ordinarily met with, and the large openings and low levels which are required for the outfall sluices. As to the form of cross-section to be given to a bank, the subject naturally divides itself into two parts: first, as to the main body for resisting the dead weight of the water when at rest, and secondly as to the mode of protecting the slope so as to enable it to resist the action of the water when in motion. With regard to the first point, the best cross-section is that in which the centre of gravity of the mass comes nearest to the bottom and to the toe of the bank. For this reason steep slopes, with a cess, or bench, above the level of high water, are preferable to flat slopes without a cess. The slopes above and below the cess need not be flatter than 3 to 1 when the bank is on samphire ground, and while the slope above the cess would need no protection, it would be sufficient to protect that below it with wood or fascine work. With a long flat slope the height of the bank ought to be greater than with steeper slopes separated by a cess or bench, for if the rule is adopted that the shock of a wave increases with the sine of the angle made by the slope with the horizon, the amount of force or intensity saved by the flatter slope is expended in giving a greater velocity to the wave running up the slope. But whatever may be the cause, it is certain that waves ascend much higher on flat slopes than on steep ones; so that, although the shock may not be so great, the protection must be carried up higher. The wave rushes up the slope until it arrives at the cess, when its direction is changed and its force checked, and if the cess is sufficiently long the force of the wave is almost expended before its direction is again altered by the upper slope. Mr. Muller gives examples of the form of cross-section proper for banks placed at various parts of the shore. When the bank is constructed on the salt marsh the body consists of clay taken from adjoining excavations, which should be well trodden down by horses, and the slopes should be sown with a mixture of meadow grass and clover seeds, and the whole slope protected by a "crammat," which is composed of a layer of clean barley straw, about 2in. thick, evenly laid, and fastened to the clay by straw bands, 60 to 90 stitches being made in each square yard. In two or three years the bank is so consolidated that the mat does not require renewal. The top of the bank is 3ft. wide, and 3ft. or 4ft. above the level of the highest known tide. The inner slope is not less than 1½ to 1, steeper slopes being liable to slip, and not presenting sufficient surface for the growth of the grass intended for their protection. The outer slope, 3 to 1, is covered with a layer of clay 12in. in thickness. When the bank is constructed farther out towards the sea, but above the level of half tide, the top of the bank is 4ft. wide, and 4ft. above the level of the highest known tide. The inner slope is 1½ to 1. The upper portion of the outer slope is 3 to 1 down to the level of the highest known tide, at which point there is a cess of 20ft. in width, having an inclination in that width of 18in. or 2ft. Below the cess the slope is also 3 to 1. The inner slope and top of the bank are covered with a layer of clay 8in. in thickness; the upper part of the outer slope, and the cess, with a layer of clay 12in. in thickness; and the lower part of the outer slope with clay 18in. in thickness. The top of the bank and the back slopes are sown with seeds, and the upper and lower portions of the outer slope are covered with crammat. This latter portion is also protected by fascine work.

At a lower level than half tide the same section may be adopted, but the covering layer of clay should be 6in. greater in thickness throughout. On the lower portion of the outer slope the fascine work, in this situation, should be further strengthened by filling in stones between the stakes, which should also be, for the same purpose, nearer together. If, instead of thus protecting the bank with fascine work, it be pitched with stone, the upper portion of the outer slope should be 4 to 1, the top of the bank 6ft. above the level of the highest known tide, the cess 20ft. in width, having an inclination of 2ft. or 3ft., and the lower portion of the outer slope should be 5 or 6 to 1. When the slopes are faced with stone they are flatter than with fascine work; for if not the rows of stone would rest upon one another, and if a wave were to remove or disturb one stone, the removal or displacement of those above it would necessarily follow. The bank is made higher on account of the flatness of the slope, for the reason already mentioned. In neutralising the action of the wave, fascine work has an advantage over stone. The slope being steeper, more of the power of the wave is expended while rushing up it, and the numerous stakes encountered so subdivide the wave that it becomes a mere ripple before it reaches the cess.

The closing of the gaps left in the line of embankment at the places where the natural creeks occur, for the purpose of allowing the water to flow in and out during the construction of the main portion of the bank, is usually done in England by filling in large quantities of material from the sides, and simultaneously to fill up the middle by means of hopper barges, with material hard and heavy enough to resist the current. In Holland, the custom is to raise the bottom uniformly, to the level of low water, by means of cradles formed of brushwood and bound together with ropes and osiers. These cradles are usually about 2ft. in thickness, and of a length equal to the full width of the gap, and of a proportionate breadth. Being flexible, they adapt themselves to all the inequalities of the bottom. The cradle is floated to its place and secured in position by laying out six or eight anchors, and is accompanied to its place by a number of flat bottomed boats. These are partially loaded with sods from the salt-marsh, on the top of which are placed as many stones as the boat can safely carry. When the cradle has been brought to the position where it is to be sunk, and the sinking-lines got ready, the stone is unloaded from the boats on to the cradle, beginning at its centre and loading it outwards. When sufficiently weighted the cradle is gradually and uniformly lowered to the bottom, and the remaining portion of the cargoes of the boats is discharged. During succeeding tides the cradle is further weighted by clay, brickbats, and stones. The sides of the opening are then protected with similar cradles, the lower end of each resting on that first laid. Subsequently, other cradles are sunk over these, until the work reaches low-water mark, when the width of the embankment is gradually increased by throwing in sods on the outer side, protected with fascine work weighted with stones. The same process is then pursued on the inner side. When the surface of the creek is level with or above low water, cradles are not required. In such cases the ground is covered with a thin layer of clay, protected by an apron of fascine work. The material for the banks is taken from side cuttings, at least 20ft. from the foot of the slope, and each part undertaken is raised to its full height in one tide. When the bank has been finally secured the gates of the sluices are opened, and the water allowed to run out of the enclosure, and the reclamation is completed.

Thus, in Holland, and also in the North of Europe, the method of closing these gaps in the bank is to reduce the depth gradually over the whole area of the gap, instead of filling up from the sides.

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PLUMBING.—No. XI.

(*Concluded from page 393, Vol. XXII.*)

CIRCUMSTANCES have prevented me concluding this series of articles till the present time. Before leaving the subject of the fitting-up of soil-pipes, I would make some further remarks, and point out a few precautions necessary to be observed. In connecting (say) a 2in. ventilating-pipe to the top of a 4½in. lead soil-pipe, or a 3in. pipe to the top of a 5in., it must be a rule always to contract the top of the 4½in. or 5in. pipe, as shown by Figs. 113 and 118, page 392, May 17th, and not to do it in the style I have sometimes seen, and as shown by Fig. 120, where the top of soil-pipe, instead of being gradually contracted as per dotted line—so as to leave no resting-place for foul air rising up—is cut square across, and a flat disc put on with hole through it, as per W, Fig. 120, in which latter case this flat disc, as I have seen, gets corroded by the foul air and full of holes. When the ventilating-pipe is finished off at top with a bend, as per H, Fig. 118, it is a good plan to bore several ½in. or ¾in. holes through top of bend. Another style of finish is that shown by Fig. 121, where the cup may also be perforated.

A word also about the amount of "drown" or water-lock which the various lead syphon-traps in a house should have. In my opinion about 1½in. or 2in. of "drown" is little enough; that is to say, that the depth of water lying, *e.g.*, in a 4½in. water-closet syphon-trap should be about 6in. or 6½in. A good "drown" or deep water-lock should be especially given to the syphon-traps in houses or mansions where the inmates are often from home for months together. For the baths, wash-hand basins, &c., no harm, but good, would be done by making the "drown" 6in. or 7in., or even more. To make it only ½in. or rather less, as is often done, is simply a bad job, and is frequently the cause of those intermittent bad smells which are sometimes so difficult to trace out properly and to the satisfaction of all concerned.

A great deal has lately been said about keeping back the foul gas of common sewer from getting into house drains, which is very well, but this is not all, for it must be remembered that foul air gathers in the house drains and pipes themselves, independently altogether of the common sewer. In order to prevent this foul air getting exit into the house, all the joints of drains and pipes must be properly and securely made; and, as above stated, all the syphon-traps must have plenty of drown; and lastly this foul air must be allowed exit up the rain-water pipes, or out at the ventilating-pipe of soil or waste pipes, or all combined. Where the pressure of gas coming back from main sewer is supposed to be great, it may be carried off and kept out of house drains by putting in a ventilating pipe to top of roof from cleansing eye of the cesspool, or syphon-trap which divides house drain from drain leading down to common sewer, as per X, Fig. 122; or, if a rain-water pipe comes handy, which is at a sufficient distance from any window, it may serve if joined below, as per X, Fig. 122. Or, again, if cleansing eye be at some distance from house and have an open grating on its top — serving also to allow passage for surface water perhaps—said cleansing eye alone will serve. In setting this syphon-trap, Fig. 122, it should be seen that the side of cleansing eye nearest to house is sunk 1in. deeper below surface of water than the side furthest from house—that is to say, that the side of tongue of cleansing eye nearest to house should dip down into water about 2in., while side of tongue of cleansing eye nearest common sewer should dip down 1in. under surface of water.

Supposing, however, drains and soil-pipes were all put in properly, and so far as they are concerned, *per se* all correct, yet there are other things still to be attended to, which must be done properly or evil will ensue, and to come to them, I must now refer to water-closets, cisterns, and their fittings.

The simplest form of water-closet is that known as the cottage closet, Fig. 123, supplied by a valve-cock with lever, handle, and weight, the water running only while lever is held up. In some cases common ground or screw-down stop-cocks are put on in place of lever-cocks, but the former often cause great waste of water by being left open, and should not therefore be allowed. The other day, *e.g.*, a property in which the tenants were complaining greatly of a want of water was set all to rights, and a good supply given by merely taking off a screw-down crane which had been put on water-closet in lower flat, and putting on a lever or self-closing cock in its place. Another form of water-closet is the well-known pan-closet, which may either be supplied by means of a crane or a valve in cistern above it. This cistern is generally put up as per Fig. 124, and in many cases not only serves for the supply of the water-closet, but also for all the water required for culinary and drinking purposes. The overflow-pipe of this and other cisterns is a fruitful cause of bad smells, and the escape of sewage gas within houses. It is actually in some cases put up as per Y, Fig. 124, with communication to soil-pipe quite open! In thousands of other cases it is just as bad by having a small useless bell-trap put in at Y only a couple of inches deep, and holding but a few teaspoonsful of water, and which being hand-filled by the plumber soon gets empty by evaporation, when the foul air from soil-pipe comes blowing out quite freely. In this latter case, when a bad smell is complained of, the plumber often comes, and finding his little bell-trap empty, he simply refills it, and, of course, stops the smell; but it is only for a few days or weeks, for it is soon emptied again. The proper remedy in this case is to cut out the small hand-filled bell-trap and put in a self-acting one, about 9in. deep, or so, in its place. Fig. 125 is section of such a self-acting bell-trap—made of lead or sheet block tin—the diameter of outside pipe being about 3½in., that of middle pipe 2⅝in., and its depth 8in. The centre pipe is 1½in. in diameter. At A, one inch from top, the outside pipe is all perforated round with holes ½in. in diameter. At B, 7in. from top, there are three small holes ⅛in. in diameter, while C is the height to which water rises in cistern. By this means both waste of water is prevented (unless, indeed, when ball-crane leaks) and bad smell kept back. Another style of fitting in overflow-pipe of cistern is to carry it down to syphon-trap of water-closet, and join it as at D, Fig. 124, a couple of inches below top of water. When this is properly done no bell-trap is required. At Fig. 124, E is the "service-box" which fills pan F with water when handle is put down; G is the air-pipe of service-box; H is a small ventilating pipe sometimes put into top of water-closet trunk and carried to outside for the purpose of carrying off any bad air which may gather between pan and top of water in syphon-trap. Fig. 126 is that known as the "Bramah" or valve-closet; its basin holds much more water than the basin of pan-closet, and consequently gives a better wash to syphon-trap and soil-pipe, but it is considerably more expensive than the pan-closet. The "Bramah," like the pan-closet, may also be fitted up either with a crane or with valve in cistern and service-box; I must say, however, that for both I prefer the service-box and valve in cistern, as shown by Fig. 124.

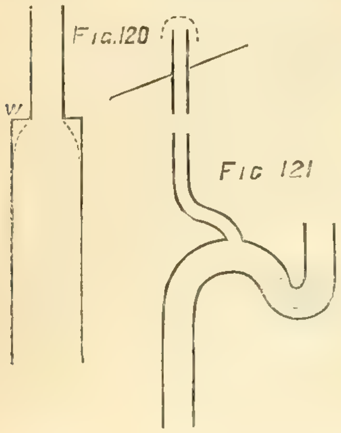

Fig. 120

Fig 121

Another style of water-closet coming largely into use of late is that where cistern and water-closet are all in one, as per Fig. 127. Of this type "Shanks' patent" is a good example; the handle I and round indiarubber ball or valve J, and in this case, also the syphon-trap, being to one side as per Fig. 127, K being the cast-iron cistern in which the copper ball L of ball-crane moves up and down. When handle is lifted the water flows out of both cistern and basin, which, causing the ball L to fall, the water from ball-crane rushes into basin, cleansing it, and when handle is put down both filling basin, and also small cistern to the necessary height. Another style of water-closet often used to preserve economy of water in its working is the double cistern self-acting one, Fig. 128, where the act of pressing down the seat of water-closet—which is hinged and fitted on purpose—causes water to flow from large cistern into small one, and when seat is allowed to rise—which it does of itself, being forced up by one end of weighted lever placed under it—the connection between large and small cisterns is closed, and the valve M, which allows water to rush down water-closet service-pipe, and flush basin, opened. To enumerate all the various styles of water-closets would be superfluous, and is unnecessary here; I therefore proceed to observe that in setting the syphon-traps of water-closets, as per Figs. 123, 124, and 126, the centre of top of syphon-trap becomes also the centre of water-closet basin above it, and in placing syphon-trap into its position, the plumber must see that it is in its right place and at a sufficient distance from back wall, due allowance being made for thickness of plaster or wood lining, &c. The distance of centre of water-closet basin from outside face of back lining is generally about 12½in. or 13in., or perhaps a little more, and if outside face of lining be 2in. (say) from stone or brick wall at its back, then the distance of centre of top of syphon-trap from stone wall would therefore be 12½in. × 2in. = 14½in. or so. Or again, when it is simply to be lime on brick then about 13½in., may serve between face of brick and centre of syphon-trap. In the case of Fig. 127 the centre of basin is not plumb above the centre of syphon-trap, but syphon-trap is placed about 10in. or so to one side, as shown; the distance out from back wall is, however, the same in both cases. After the syphon-trap has been properly fitted into its place, and the flooring laid above and round it, the plumber generally lays down a lead safe or tray about 2ft., 3ft., or 4ft. long, as the case may be, and about 2ft. broad. It is turned up all around its outer edge to the height of 1½in. or so. Upon this safe the trunk of water-closet (Figs. 124, 126, 127) is laid, being bedded with putty and fixed with screws or nails; the basin is also bedded with putty, or, in the case of Figs. 126 and 127, with red lead or cement, while the connection between basin and "service," or supply-pipe, to it is made with putty and cement formed by melting rosin and tallow together. A lead or tin "fan" is also fixed to inside of basin by two brass bolts and nuts, so as to cause the water to rush round basin and cleanse it. In the case of basin for Bramah closet a lead fan with horn is put on outside, owing to basin coming from pottery without any horn upon it.

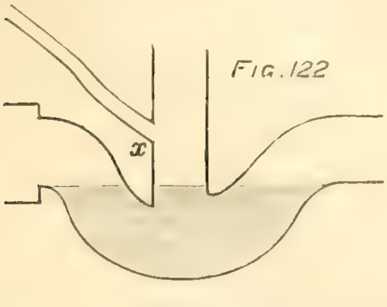

Fig. 122

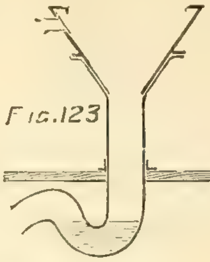
Fig. 123

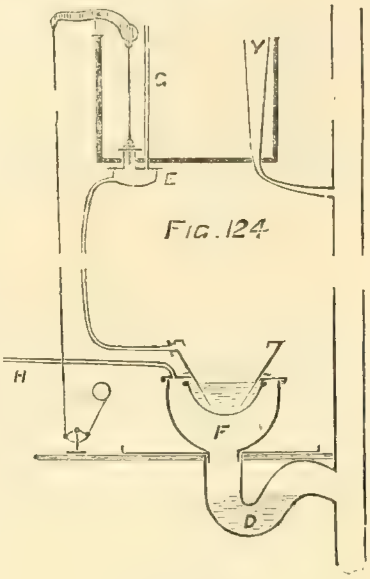

Fig. 124

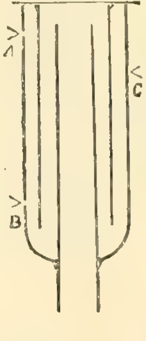

Fig. 125

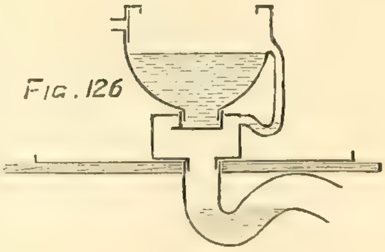
Fig. 126

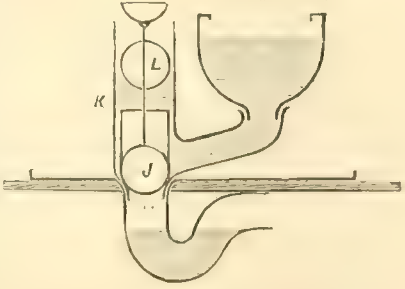

Fig. 127

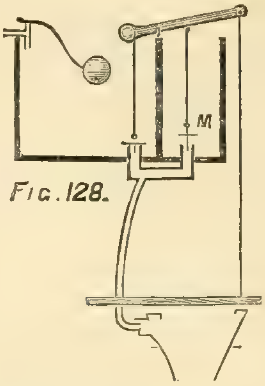

Fig. 128.

Instead of using putty and cement with strip of cloth and twine to make connecting-joint between basin and supply-pipe, the latest plan is to use a tapered indiarubber coupling or cone, open at both ends, and about 2¾in. long; the small end grasps supply-pipe and the larger end the horn of basin.

It is incumbent upon every true architect, and upon all who have it in their power, to see that the water cistern is properly protected. One style of doing this where cisterns are so placed as that the cistern of one flat or house is immediately underneath the water-closet in flat or house above it is shown by Fig. 129, where a wooden board, N, longer and broader than cistern, and covered with lead, is fixed in above cistern and close to ceiling at its back, but with a little inclination downwards and outwards to front as

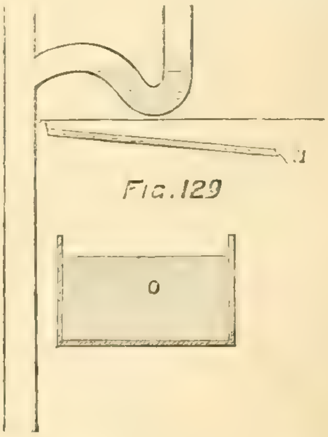

Fig. 129

shown. In this case, supposing water-closet above be out of order and overflowing, any foul water coming down cannot get into cistern O underneath, but instead falls down beyond it and on to floor, thus at once giving warning that something is wrong.

Plumber.

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DUNDEE.—LETTER II.

[From our own Correspondent.]

THE longest bridge in the world is the Victoria, over the river S. Lawrence, at Montreal. It consists of a heavy iron tube, resting upon twenty-four intermediate piers, and is 9,194ft. in length. The bridge now in course of construction over the Tay, at Dundee, will be 10,321ft. in length; 1,127ft. longer than the Montreal structure. It will have ninety intermediate piers and eighty-nine spans. The piers are being formed with double cast-iron cylinders filled in with brickwork. They are built upon the shore, floated into position by means of pontoons, and then lowered to their foundations prepared upon the solid rock. 2,600 tons of cast iron will be used in their construction. The superstructure will be in malleable iron, of which about 3,600 tons will be required. Starting from Newport on the Fife shore there will be three spans of 60ft. each; two of 80ft.; twenty-two of 120ft.; and fourteen of 200ft. each. These will reach the centre of the river. On the Dundee side there will be sixteen mid-channel spans of 120ft. each; twenty-five of 66ft.; one of 160ft.; and six of 27ft. each. The extreme height of the bridge above high-water mark will be 88ft. The gradient of the roadway will be 1 in 100 for the first three spans on the Newport side; then 1 in 353 to the centre; therefrom a similar gradient will be adopted for a considerable distance, and, finally, the Dundee shore will be reached with a gradient of 1 in 73. The engineer is Mr. Bouch; the resident engineer, Mr. Paterson. Messrs. De Bergue & Co., of Manchester, have the contract for the whole of the works for £217,000. The sub-contractors are the Falkirk Iron Company for the cast iron work; Messrs. Small & Co., of Glencarse, for brickwork; Messrs. Donaldson & Son, of South Alloa, for the woodwork; and Messrs. Grothe & Austin, who are the patentees of the process by which the piers are constructed and placed, and the general acting contractors for the erection of the bridge. Several of the piers on the Newport side have already been erected upon foundations 18ft. below the low-water, and 32ft. below the high-tide, level. The present arrangement will provide only a single line of rails for traffic, but the directors of the North British Railway appear to be prepared to lay down a double line, provided the people of Dundee will contribute towards the additional expense. The grandeur and usefulness of the bridge will be greatly impaired by the working of a single line only over its length of one mile and three quarters. The greatest undertaking, of its kind, in the world, it should be the most complete. If the railway directors can do no more for profit the Burgh should join forces with them and do the rest for honour.

Public spirit and liberality are kept alive by grand individual examples as well as by general assent in Dundee. Upon the death of the late Prince Consort, upwards of £24,000 was subscribed to erect an institution to his memory in the burgh. Sir G. G. Scott prepared plans for the erection of a building upon the best site that could be procured, to contain a philosophical institution, a free public library, a museum, a picture gallery, and a public hall. A portion of this building, comprising the public library, and hall, was erected under the superintendence of Sir G. G. Scott, and the completion of the original scheme is now going on under the superintendence of Mr. David Mackenzie, architect, of Dundee. The first portion is not a good specimen of the happy treatment of Gothic, of which Sir George has produced so many fine examples, and the rooms are badly lighted. The additions now in hand are in strict keeping with the character of the original design, but the windows have larger areas and single instead of triple-shafted mullions. Mr. Mackenzie's additions will give to the south front a length of over 200ft. A picture gallery forms the centre of this front. It is lighted from the roof. A museum occupies the extreme east end. It has a gable of Scotch Baronial character, which balances the gable of the large hall at the west end. Corbelled turrets, and crow-stepped dormer gables here and there, serve to nationalise, while they add piquancy to the structure. The walls are built in random range-work with stone from the Weal quarries. The dressings are in stone from the quarries near Bannockburn. The cost of the additions will be about £10,000, of which sum Sir David Baxter, Bart., has contributed £1,000.

Sculpture, as represented in the public memorials of our large towns, is an art upon which the ignorant smile, while "the judicious grieve." The sculptor alone knows his difficulties and his alien surroundings in Great Britain. He requires, after his eye and hand have acquired the mastery over his materials, three conditions—time, quietude, and happiness of heart. He has to conceive, mature, and execute. An inspiration which an architect or painter may indicate by a momentary sketch to be developed at leisure, he has to sustain by a pure psychological effort for weeks, months, years! And woe be unto him, and more woe to his work, should his beautiful or heroic conception languish from any cause whatever! To those who know the psychological and mechanical process of the sculptor's art, the marvel is, not that there should be bad and melancholy examples of sculpture in Great Britain, but that there should be men in this somewhat unheroic age who can live to be sculptors of even moderate excellence. On the north side of the Albert Institute, in Dundee, is a bronze portrait statue, recently produced by the veteran sculptor of Scotland, Mr. John Steell, R.S.A., and erected as a memorial of Kinlock, of Kinlock, the first representative of the burgh in the reformed Parliament. It is not a production to pass unchallenged, although it can be one for which there may be an excuse. Not by this Kinloch statue, but by some exquisite bronze relievos for the Albert Memorial—at present in the sculptor's studio—in Edinburgh, will this current period of his career be distinguished.

Messrs. Edward & Robertson, architects, of Dundee, are largely contributing to the good Gothic work of their locality. From their designs a Gothic church of simple character to accommodate 600 persons on the ground floor, and 360 in galleries, is being erected for the members of the Established Church in Constitution-street. It has about 70ft. by 55ft. floor area, divided into a nave and two aisles by arcades of three bays. The nave walls are 31ft. high; the aisle walls are 21ft. The roofs are half open.

The same architects have prepared a design for a new church for the congregation of S. Enoch, in the Nethergate. It is good fifteenth century work, showing a nave with two aisles, divided by arcades of three bays, having polished granite shafts, and carved capitals. Their power has been exercised on the south front, which is flanked by two square towers with pinnacles, 100ft. high. The interior will be very ornate. Accommodation is provided for 900 persons.

An exceedingly chaste and well-considered Gothic cruciform church has been erected by the same architects at West Broughty-Ferry, the marine retreat of the Dundee merchants. Sittings are provided for 550 persons. It has a spire 112ft. high. The nave roof is 42ft. high; a height secured for the possible gratification hereafter of the Scotch desire for galleries. The same desire has led the architects to introduce clerestory windows in the aisles of the church. Yellow cathedral glass with ruby borders, some coloured decorations, texts, and panelled diaper work in the roof, together with the general artistic treatment of the whole interior arrangements, indicate a recurrence in Dundee of the old historical facts that merchant princes encourage taste, and commercial prosperity is the cradle of art. Some carvings in this church have been very nicely executed by Mr. Grasby, of Glasgow.

A Sabbath in Dundee will no longer be a day of sadness and silence. Some of its good men have been away from home "where bells have knolled to church," and the genial influence upon their minds has borne extraordinary fruit. The first peal of bells in the burgh has been recently hung in the United Presbyterian Church at Lochee. Another peal has been ordered for the Episcopal Church of S. Paul, and a third peal for the old tower of S. Mary's is also in the founder's hands. Honour to the men who have accomplished this humanising revolution! All the peals have been entrusted to Messrs. Mears and Stainbank, of London.

The church at Lochee, wherein six of the peal of eight bells are now hung, has been recently completed from the designs of Mr. James Maclaren, architect, of Dundee. It is 71ft. by 58ft., and with the gallery sittings will accommodate 1,000 persons. Carvings, stained glass, enamelled tinted cathedral glass, elaborate coloured decorations, and fittings of good ecclesiastical character, produce an effective interior, much in advance of the national feeling in church matters. The church stands in spacious ornamental grounds, laid out with carriage approaches. The south, or principal front, has a richly-moulded central doorway with serpentine shafts, an elaborate five-light traceried window, flanked on the east by an octagonal staircase, and on the west by a tower and spire 120ft. high. The whole of the details of the decorative work were designed by Mr. Maclaren.

Mr. Maclaren is now engaged in the erection of a series of what are known as "tenemental houses" of the best class, in Airlie-place, off the Perth-road. One of these terraces consists of five blocks, four stories high, exclusive of the basement. In each block there are eight houses. On the ground floor the houses are respectively eight and four-roomed, inclusive of offices in the basement. On the upper floors there are houses of five, four, and three rooms each. Every house has a bath-room, water-closet, lavatory, dust-shoot, and meat-larder. These are some of the first examples of houses furnished by the landlords with grates, Venetian blinds, and gas-fittings. Drying greens are provided at the back, and gardens in the front of each block. The walls are stone. The elevations have oriel windows and ornamental iron balconies on each floor.

In Croft's-lane, off Hawkhill, Mr. Maclaren has in hand four blocks of houses, five stories in height, which may be considered middle-class "tenemental houses." They are in general arrangement like the higher class in Airlie-place.

Messrs. Young & Meldrum, architects and C.E.'s, Dundee, have completed a block of 38 working men's houses at Pole Park. Each house has two rooms 13ft. square, and 9ft. 6in. high. They are approached from balconies or "platts." One room is fitted as a kitchen, the other as a parlour; both are used as bedrooms.

The Dundee Working Men's Houses Association, Limited, has expended about £6,000 in the erection of tenemental houses in Balgay-street, off the Blackness-road. These are two-roomed houses, in blocks. Each house has a separate water-closet, a garden plot, either front or back, a larder, and water supply. On the upper floors each house has two attics, in addition. The cost of these upper four-roomed houses averages £130 each. The houses of two rooms each, on the lower stories, cost about £87 10s. each. The feu, or ground-rent, of each house is 15s. per year. The legal fees, included in the cost, £1 1s. per house. The cost, per house, also includes road and sewer-making. The architect of the company is Mr. Robert Hunter, of Dundee; the manager, Mr. W. Scott, jun., W.S., whose devotion to the scheme has largely contributed to its success.

Did space permit, one might call attention to the details of the restoration of the interesting fourteenth century tower of S. Mary's Church, known as the "Town Steeple," now in progress under the personal superintendence of Mr. James Yeoman, as the representative of Sir G. G. Scott. This tower—all that remains of the original church—is 156ft. high, and has walls 8ft. in thickness. It was originally surmounted by a crown, of the same character, probably, as that of S. Giles' in Edinburgh or S. Nicholas, in Newcastle. This crown has been taken away, and a small slated house has been constructed in its place. Sufficient traces of the original crown remain to ensure its reproduction, but, unfortunately, the popular feeling is in favour of retaining the old house. This is a mistake, which the promoters of the restoration will discover to their regret. Dundee is singularly poor in architectural structures of any height. Hence, it is all the more lamentable that the charm which the replaced crown of this tower would give to the scenic effect of the whole town cannot be realised. Sooner or later the crown must be replaced, and those who are "wise in their generation" will do the work.

Returning to the engineers and their projects, one may briefly note that Mr. Bateman, of London, and Messrs. Stewart & Leslie, of Edinburgh, have rival schemes for a water supply to the town. The plan of the former will cost £222,000; the estimate of the latter is from £176,000 to £185,000. The present supply is derived from Monikie, to the north-east; the proposed new source is at Lintrathen, about 18 miles north of the town.

The new harbour works now in progress will cost £81,980. They consist of a new dock, to be called the Victoria-dock, and a graving dock. In the construction of the dock 200,000 cubic yards of earth will have to be removed. The walls will contain 30,000 cubic yards of rubble masonry. The graving dock will be 500ft. long upon the floor; and 525ft. between the caisson gates. The breadth will be 77ft. at the top, and 45ft. at the bottom. The depth below ordinary high water, spring tides, will be at the entrance 19ft. The greatest depth from the coping level will be 26½ft. The stone is supplied, with the cost of quarrying only, to the contractors, from the quarries of Pyotdykes and Kingoodie. The plans have been prepared by the engineer to the harbour trustees. The contractors are Messrs. A. & K. Macdonald, of Glasgow.

Numerous works of more or less importance are in progress in the town. On all sides there are signs of growth, and proofs that while utility is being demanded art is not forgotten. Well up in the race, and wealthy enough to continue it, one may fairly predict that among our large towns one of the first to approach the goal of improvement will be

"Ail-lee,"—the beautiful;—
"Bonnie Dundee."

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CELEBRATED QUARRIES.*

IN a popular work on geology published some years ago, Mr. Burat stated that the 18,000 quarries worked in France employed about 70,000 persons, and the annual produce of their labour amounted to more than two millions sterling. There can be no doubt that the quarries of Britain and Germany are at least equally productive, and thus a very moderate estimate leads us to conclude that the quarries of Europe employ at least half a million of men, and produce an annual value of no less than £12,000,000, a sum probably doubled or trebled before the heavy material can be placed in the hands of the consumer.

Granite, porphyry, and other stones are susceptible of a fine polished surface, and are extensively used in decoration, but the numerous varieties of marble or compact limestone are chiefly employed, both on account of their beautifully-variegated tints and the comparative ease with which they may be worked. The quarries of Devonshire and Derbyshire yield a variety of richly-coloured marbles, but the best material for the sculptor is the pure white homogeneous marble of Carrara, with its fine granular texture. The famous Carrara quarries, which were opened in the time of Julius Cæsar, are situated between Spezzia and Lucca, in the Alpe Apuana, a small mountain group totally isolated from the Apennine chain, from which it is separated by a wide semi-circular plain. Where the Alpe Apuana faces the sea, it consists chiefly of magnesian and glimmer slate in which large masses of limestone are embedded, but the inland part belongs entirely to the limestone formation, abounding in romantic scenery and noble peaks six thousand feet above the sea level. Towards its north-western extremity rises Monte Sacro, 5,200ft. high, the marble mountain on whose slopes lie the quarries that have gained for Carrara its world-wide celebrity. The quarries themselves are not imposing, as they are mostly small and badly worked, but the transport of the huge blocks of the superb material from the glens in which the quarries are situated is an interesting sight. In the town of Carrara numerous sculptors are constantly employed in rough-hewing the marble into various forms, in order to diminish the cost of transport or to discover faults in the stone. The window and door frames, the flooring and chimney slabs, in the meanest houses are all of marble. It is even used for paving, and strikingly contrasts with the poverty otherwise evident.

The interest attached to the great works of Greece is shared by the quarries which furnished their materials. The Pentelicon, from whose flanks was extracted the marble that served to build the Parthenon and the Temple of Olympian Zeus, is situate about eight miles north of Athens. The ancient roads thereon still show the traces of the sledges on which were drawn the huge blocks that now lie scattered among the ruins of the Acropolis. On the summit of the mountain the Athenians placed a statue of Pallas Athene, and there, from a height of 3,500ft., the goddess looked down upon the land devoted to her worship, a prospect now all bare and naked, yet having for its embellishment the beautifying remembrances of the past.

The Parian marble, the most prized for statuary in ancient times, came from Mount Marpena, in the Isle of Paros. It was called lychnites, because worked by lamp-light in deep mine-like excavations; it had a yellowish white colour, and a texture composed of fine shining scales lying in all directions. Twenty centuries have elapsed since the abandonment of these quarries; in our own days, however, a company has been formed for working the beautiful marble recently discovered near S. Minas, not far from the ancient quarries, and said to be superior to that of Carrara, or to the renowned Lychnites of the ancients. The quarries which in olden times furnished the Rosso Antico and Verde Antico marbles were also for many ages totally abandoned and forgotten. They were rediscovered in 1846, on the Island of Tino, and in the Maina, by Professor Siegel, who undertook to work them, and among other specimens have furnished a number of the columns of Rosso Antico which decorate the interior of the Court of the Basilica of S. Paul's in Rome.

Passing away far northward to the mountains bounding the Oesterdal Elbe, in Sweden, we find the finest quarries of porphyry which Europe possesses. This beautiful stone consists of a red-brown or blood-red mass, in which numerous small flesh-coloured felspar pieces are embedded. After having been rough-hewn on the spot, the blocks are transported to the neighbouring works of Elfdal, where they are cut and polished. The porphyry of the Altai mountains in Asia is also well known. It consists of a brown-red mass with snow white crystals, and receives a very fine polish. The quarries are situate on a high rock on the left bank of the Kurgun, a wild mountain stream of the Altai, about one hundred miles from the town of Kolywansk, where it is cut and polished.

The famous alabaster quarries in the neighbourhood of the ancient Etruscan town of Volterra, anciently called Volathri or Volaterree, have afforded constant employment for centuries to the inhabitants—even women and children are all employed in sawing, cutting, or rasping alabaster. Art, however, has degenerated into mere manufacturing ability; all the objects are repetitions of the same models, and those not the best. Great Britain possesses apparently inexhaustible quantities of alabaster in the neighbourhood of Derby. The bulk of it is used for the manufacture of plaster of Paris, for manure, and as the basis of many other cements. This alabaster, when preserved from the action of water, is very durable, as may be seen from the many monumental effigies composed of it in the churches of this country.

Wales possesses in her slate quarries a great source of mineral wealth. In the northern part of the Principality the face of the mountains is everywhere dotted with slate quarries, of which the most important are those of Llandegui, six miles from Bangor, where more than three thousand persons are employed. They have their own harbour, Port Penryn, whence slates are sent to all parts of Great Britain and even to America. The cost of the inclined planes and railroads which serve to transport the slates from the quarries to the port is said to have amounted to £170,000.

The most extensive quarries in Europe are probably those of S. Peter's Mount, near Maestricht, in the Netherlands. The white tufaceous limestone of this mountain has been used from time immemorial for building and manuring. The quarries extend for miles into the mountain, the endless passages perpetually crossing each other to the right and left, and ending in utter darkness. In 1640 four Franciscan monks resolved to construct a chapel in a deserted part of the caverns. Taking with them a thick pack of thread they penetrated deeper and deeper into the unknown vaults as long as the thread held out, and at length came to a larger cavity or hall, which had probably not been previously visited for centuries, but which, in consequence of their misfortune, has become one of the show places of the quarry. At the entrance one of them drew with a coal a sketch of his convent on the wall, and wrote underneath the date of their discovery, which is still to be seen. Wishing to retrace their steps, they found to their dismay that the thread which alone could lead them out of the labyrinth had been severed. Seven days' search for them by their brethren of the convent only resulted in the discovery of their bodies lying closely together with their hands folded as if in prayer. More than once these quarries have been the scene of sanguinary conflicts.

Near the small village El Massara, standing on the Nile bank in a grove of palms, are the quarries which furnished the materials for the temples and pyramids of Memphis. The traveller might indeed suppose that all the eighteen thousand towns of ancient Egypt had been dug out of these excavations. In one part the mountain has been cut through from top to bottom, at another hollowed out into enormous halls, whose roofs are supported by Titanic pilasters. Here and there lie immense masses of stone, on whose chiselled sides Time has scarcely left a trace, evidently severed from the mountain by the hand of man, but of such a size as even to baffle the perseverance and mechanical ingenuity of the Egyptians.

Perhaps the most famous of the ancient quarries is the tabomiæ of the Capuchins at Syracuse, now a noble garden, the same that Cicero describes as a vast and magnificent work of the tyrants of ancient Syracuse, hewn out of the rock to a prodigious depth. From this terrible prison-house the genius of Euripides liberated many of his Athenian countrymen, who were there immured after the defeat of Nicias, but who, happening to sing a chorus from one of the great poet's tragedies, were liberated by their Syracusan conqueror in honour of their illustrious fellow citizen.

NOTES ON THE CHARACTERISTIC TREATMENT OF MATERIALS IN DESIGN.*

(Concluded from page 181.)

THE simplest way of treating the joint, when dealing with ordinary brick, is just to bevel off the mortar with the trowel (Fig. 12, p. 158) so as to leave the under edge of each brick to form a drip while the mortar forms a weathering to throw the wet out of the joint. By this system "pointing" is entirely omitted, and the mortar incorporates into one mass at once, instead of a second edition of it being run into the joint again, after the first is set.

An instance of the unsatisfactory result of employing material in contradiction of its strongest method of construction, is afforded by the frequent practice with speculative builders, in "designing" brick houses, of putting a kind of architrave round the windows composed of bricks, generally of a different colour from the rest, slightly projected. Why is it that this, to the architectural eye, always has a disagreeable, not to say vulgar, expression? Simply, I believe, because we know that brickwork, to make good work, ought to be bonded in courses breaking joint, and we see that, in this way of employing it, the bond is ignored, and entirely broken.† Variously coloured bricks appear to me a very legitimate source of effect, when not overdone: but here again we are running too exclusively into stripes and bands; and it would be quite possible to apply constructive colours in a broader manner than this over large surfaces, though great care would have to be taken in the selection, owing to the raw disagreeable tints of many, especially of our "patent" bricks, as they are termed. This mode of applying colour has been tried by Mr. Seddon in a large terrace of houses at Aberystwith, where the lower stories are of a reddish brick with stone dressings; the upper story, which forms a kind of "attic," is of a warm buff or orange tinted brick; this upper portion, from the principal point of view, is seen against a distant blue mountain as a background. I am told by those who have seen it that the effect is very successful.

When we come to consider woodwork, we are, of course, on quite different ground from brick and stone: we are dealing with a fibrous material, of considerable tensile strength, and capable also of resisting cross strain to a much greater extent than stone. The readiness with which most woods may be shaped into whatever form the workman fancies has led to this material being desperately misused. It has been made a kind of medium for all manner of gross, cheap, and flimsy imitations of stonework; and the first thing to say, in regard to design in this material, is to raise a protest against all kinds of boxing and building up of wood erections to imitate stone forms. The modern English joiners have got into bad habits in this respect, which it seems almost hopeless to attempt to eradicate for a generation or two. The system of sash windows, with their cumbrous accompaniments of "boxings and casings," as they are facetiously termed, for the weights, have continued to keep afloat this notion, that wood is nothing but a convenient material for sawing up into thin slabs, and glueing together to form sham pilasters, sham pedestals, sham cornices, and sham everything. Now, the first great commandment with regard to wood should be—use it solid—but the English joiner must be carefully watched to ensure his doing this. His tastes are so degraded that if he can cut up and bolster up up a thing instead of making it solid he will do so, even at the cost of extra time and labour. He has the same superstition, for instance, about stair newels, that the mason has about gatepiers: they must have a "plinth;" and it is his delight to nail and glue four pieces round the bottom of it, and then to nail and glue a preposterous cap on the top. Recently I took the precaution, in specifying the staircase of a house, to observe particularly that the oak newels were to have caps and pendants "worked out of the solid," and the detail for them was made accordingly. It was no use: Visiting the house one day, I found the joiner and his satellites had got up the bodies of the newels, and were busy in fastening the heads and tails on them. These will all come off some day, whereas the solid post might have lasted for any time. I am not clear that they had not made them each in one piece first, and then cut them up afterwards, The Mediæval wood-workers never, as far I know, did this kind of thing; but they were certainly guilty of an error in design when they used wood in their screens and reredoses to imitate stone designs, and cut it into the shapes of arches and buttresses. As a general rule, I think that wood should always be used, in constructive design, as much as possible in straight lines, and not in curves and twists; and in this respect some of the simpler Early Gothic roofs, with framed rafters, were more satisfactory in their treatment, as regards the material, than the later hammer-beam and flat pitched roofs, with their curved braces; though there may be cases, no doubt, where the curved braces or angle-pieces are the best form for combining strength with satisfactory outline. As an instance, however, of the pertinacious adherence to errors on the part of the ordinary joiner, I subjoin a sketch of the entrance gates (see p. 158), to a row of new houses in my neighbourhood. Panel treatment, as before observed, is a natural and sensible way of using wood, and may be made further ornamental at a slight expense, by perforation in a symmetrical pattern; in fact, this working out of a design in woodwork, by simply piercing through it, without any surface carving, may be carried to a considerable degree of elaboration. I see that Mr. Eastlake, in his work on household furniture and decoration, says that where this kind of ornament is used, the pattern should always be formed by the opening, and not by the solid portion; but I do not entirely agree with him here, and have seen this kind of work carried out on the opposite method with very good effect. In carved ornaments, a much greater latitude may be allowed to the artist in wood than in stone in his imitation of nature, the fibrous tenacity of the material allowing of much greater delicacy of execution.

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* Abstracted from "The Subterranean World," by Dr. GEO. HARTWIG. London: Longmans.

* Read before the Liverpool Architectural Association by H. H. STATHAM, Jun., Esq.

† One of the most edifying instances of false construction in brickwork is the lintel shown in Fig. 13 (p. 158), where an iron flanged beam carries the superstructure, but the brickwork is built in between the flanges for "uniformity," thus nearly concealing the beam, and giving the brickwork the appearance, at a little distance, of hanging in the air unsupported. This piece of "builders' architecture" seems to be much in favour in recent railway erections.

Wood, however, is a very unimportant material in comparison with that which we are told has given its name to the present century—" the iron age." Now, in regard to wrought iron, I do not say much, because I think the material is better understood, as to its capabilities and specialities of treatment, than any other which is in use at present. One point in designing ornamental wrought-iron work, which is not always observed, is to make the necessary points of junction of the material furnish features in the design; where this is omitted, and a bare rivet or two openly put through at the points of contact, the result is somewhat slovenly. It is in the use of cast iron the tug of war comes; and there is, perhaps, hardly any species of vulgarity of which this unhappy material is not made the medium. The very worst forms of the most commonplace Renaissance, festoons, wreaths, dolphins, and other such things, which even when carved in stone are wretched enough, are here translated into a material too coarse to give anything but a caricature of the details attempted to be expressed. Like wood, too, cast iron is made to imitate all kinds of other things, classical columns, and pedestals, and statues from which all the spirit and finish which the carver might have imparted to them has departed—literally been *cast* out. The latest novelty appears to be the invention of cast lintels, straight and arched, which are carefully described as "ornamental," and which, we are assured by their advertisers, will quickly supersede stone. In the advertisement of these precious things, in one of the building papers, it is also stated that they are always sent off from the works with two coats of paint, and that when the purchaser gets them he has only to give them another coat, and then sand them, when they will look just like stone; and, of course, you can get a great deal more "ornament" for your money. Now, though cast iron is a material I would never use when I could use wrought, still I think it is capable of being treated in an artistic and architectural manner; but this must be by avoiding all attempts to accomplish more than the material is fitted for, or to imitate in the slightest degree the effect of carving. The proper style of design for cast iron would be, I think, that where the material is used in the simplest and plainest manner, and what little ornament is introduced should be almost entirely formed by direct sinking the surface, not by any attempt at elaborate surface manipulation, which must always be coarse and commonplace in effect, especially when we take into consideration the necessity of further filling up the wrinkles and blunting the edges with three coats of paint, and others to follow. In the treatment of capitals to cast-iron columns, for instance, instead of planting on wretched coarse imitations of stone carved foliage (Fig. 14), as in the Museum at Oxford, I would have the bell of the capital ornamented, simply by a symmetrical sunk and raised pattern—it might take the form of a conventionalised leaf—but without any attempt to imitate the sharpness which can only be obtained by carving (Fig. 15). Large spaces may be not inappropriately treated in something the same manner as woodwork, that is, cast as a framework first, with panels left to be filled in with lighter castings, with a perforated pattern in them. And it should certainly be remembered, in dealing with cast iron, that one of its most marked characteristics is its capability of being used in thinner and lighter proportions than any other material for the same amount of strength; this quality the designer should always avail himself of to the utmost, to give distinctive and constructive character to his design in this material; always using it in as light and thin lines as he can, and never for a moment imitating, in external appearances, the solidity and massiveness proper to stone, or even to wood design. In this respect it may be noticed that our ancestors, about a hundred years or so back, showed better taste, in a general way, than we do; for nothing could be better suited to the nature of the material than the designs for cast-iron railings, and lamp brackets, and standards, to be found in connection with many of the interesting old brick houses of that date in the outskirts of London, about Stoke Newington and elsewhere; and I noticed the last time I was in Westminster Abbey some railing of about the same date and style in the north transept, which did not certainly harmonise with the general character of the building, but which in itself is a capital specimen of what may be called sensible cast-iron design, formed mainly by light symmetrical spirals and twists of metal, in a manner which could not be accomplished in any material except iron. That is one of the best tests of truthfulness of treatment of a material, when we perceive at once that the design could not be carried out in any material but that one.

Some of the same remarks which apply to cast-iron design, will apply, I conceive, to that other cast material, plaster, the delight of ornamental jerry builders, and the curse of architects. As a general rule, the whole of the designs for ornament to be executed in plaster might as well be condemned *en masse*—at least there are very few exceptions; and it would, in any case, be no great loss, probably, if we could get plaster ornament out of our houses altogether. Still, this material has its capabilities. It is constantly misused, because so light and so easily put together that the workers in it cannot resist the temptation to do all kinds of flimsy things with it; they run quite an extensive flower garden round the corners of the sitting-rooms, and in the middle of the ceiling there is the semblance of a great cabbage or cauliflower spread out. The whole subject of the treatment of cement and plaster in decoration is (if they are to be "treated" at all) quite worth taking up as a separate matter. At present, what I should say about plaster ornament is, that it is tolerably harmless as long as it does not attempt to imitate carving and undercutting. This, however, is just the great sin the plasterers are guilty of; they are not satisfied with a simple ornament that can be cast at once, but must needs stick on to it additional flowers, and leaves, &c., to look as if they were deeply carved and undercut, which, as it is a cast material, palpably cannot be the case; and which added beauties also have, naturally, a habit of falling off now and then. Now I would suggest that all plaster ornament should have more or less the character of a stamped or impressed pattern, kept flat in treatment, and with no attempt to imitate natural foliage, but used in conventional ornaments of a simple kind. One or two suggestions of this nature are hazarded in Fig. 16. The centre ornaments, again, instead of being masses of plaster vegetation, of a rank and luxuriant description, should consist either of a very flat and delicate leafage ornament impressed on the surface of the finishing coat, or, if greater relief be given to them, they should take the form of a simple geometrical pattern of a strictly architectural character, with the interspaces filled in with conventional ornament. I think, also, it would be a perfectly practicable thing, and an improvement certainly on our expenses of dead flat ceiling, to impress a small diaper ornament over the ceiling while the finishing coat was wet; this could be done, perhaps, by a pattern cylinder, and would furnish a good basis for light colouring. In regard to the treatment of cement, nothing that can be called architectural has been attempted yet that I know of, if we except a house built recently by Mr. Cockerill, a drawing of which appeared in the Royal Academy last year, and which showed some novelty of treatment. It would be possible to use cement externally with architectural effect, but it must be on a quite different system to that in fashion at present, of imitating stone cornices, pilasters, pediments, &c. It would have to be treated in a perfectly flat manner, and with impressed patterns; and I should think it was doubtful whether anything tolerable could be made out of a house entirely faced with this material, thought it might be used in combination with brick or stone, perhaps, with novel effect.

One other subject I wish to touch upon before concluding these rambling remarks, because it is of importance in itself, and for one or two reasons has a particular interest at present: I mean the artistic treatment of stained glass. We have been very much at sea on this subject for some time past; and even the architects and artists seem to have been very unsettled in their ideas as to the proper treatment of stained glass. There has been, of course, a good deal of imitation of Mediæval work in this way; in fact, in England it has been little else but that; but mostly not of the best class of Mediæval work, of which remains are not, I believe, very numerous. Now, what is stained glass? It is an arrangement of the glass which is required for the transmission of light, in the form of a coloured design seen by transmitted light, and formed by a number of small pieces of variously coloured glass, put together by the aid of lead. I call this, which is termed "pot metal glass," *i.e.*, in which the colours are fused bodily into and incorporated with the glass, the only true glass staining art; since, I believe, experiment leads to the conclusion that no painting or enamelling on the surface of the glass merely can be depended on for absolute durability. Now, these conditions lead to two conclusions. In the first place, that, the glass being really a plane for the transmission of light, nothing but a perfectly flat treatment of it can be allowable; no attempt at background, or foreshortening, or perspective can be entered into without involving an absurdity; and even if the nature of the situation permitted us to use linear perspective, the nature of the material renders all attempt at aërial perspective quite impossible, so that a mere coarse caricature must be the result of any attempt to represent nature or natural scenes. In addition to this, the difficulties attending the manipulation of the material render it next to impossible to carry out large figure subjects with any approach to the force and variety of expression which a "picture," properly so called, ought to have; and all these considerations tend to show that what is really required in stained glass design is rather an arrangement of colour design in diaper patterns, with perhaps, single figures of a somewhat conventionalised nature, introduced with care, and with no attempt at anything but a flat outline treatment, without perspective and without foreshortening. This is what I believe stained glass, to be a satisfactory and reasonable form of art, must be restricted to; but so far from this being any injury to it, these very restrictions ought to prove incentives and suggestions to novelty and originality of treatment. Unfortunately, just as some of our most thoughtful designers and critics are beginning to recognise the true province of stained glass design, public attention is being directed to the works of a school essentially false and bad in almost every way, that of Munich. Discarding the brilliant and durable pot metal treatment, the artists of this school have taken entirely to painting and enamelling on the glass, a process which gives a dull hue, quite different from the rich glow of the pot metal glass; and they are occupying themselves in painting pictures on the glass, with background and distance, and everything the same as if on an easel picture. Besides the objections already mentioned to this picture-painting on glass, there is the serious one that not even good pictures can be painted on it; for the material will not, whatever you do with it, admit the gradations of tone necessary to make a picture, and the result is a coarse transparency, like the work of a panoramic artist. It is impossible in any merely parliamentary language to do justice to the fearful things that were sent to the International Exhibition by Munich glass artists last year: "Hamlet and the Gravedigger," for instance, looking like a couple of figures off the booth of a travelling showman, with a great mass of dirty green hill and tree spread out behind them. As to their colouring —the raw yellows, and the dirty browns, which are spread over the glass—I am unworthy to describe them. But this fatal mistake in stained glass is gaining ground. One of the London firms had a window in the same style also in the Exhibition, with pink and yellow architectural details, and a hilly background; and now the S. Paul's Cathedral Committee, not content with having already three specimens of this spurious art in the Cathedral, have, I believe, just ordered three more, for which they are asking the public to subscribe. Surely some action ought to be taken about this, and a protest raised against the filling of our only Renaissance Cathedral with specimens of one of the greatest possible mistakes that can be made in ornamental art.

There are, of course, many more points in relation to the connection between design and material which are well worth consideration; the foregoing are what have been brought under my notice, or what have come to my recollection while writing; and if I have touched very lightly and imperfectly upon the various points brought up, I hope I shall, at least, have succeeded in calling forth a little of that healthful disagreement and antagonism of opinion which is the best provocative of discussion.

SHOPS IN CAMBORNE, CORNWALL.

ONE of our illustrations is that of two shops in course of erection at Camborne. The materials used in the front are white China clay bricks. It is intended to fill the panels, &c., with coloured tiles. The lintels are of granite, so also are the piers and plinth on the ground floor. The wall to the first floor is 14in. thick, and 9in. on the second floor, the set-off being on the outside. The columns to the windows are of cast iron. The frontage is about 56ft., and depth of shop 30ft. Kitchens, &c., of one story, are arranged at the back. The total cost will probably not exceed £1,100. The architect, from whose sketch the illustration is taken, is Mr. James Hicks, of Redruth. The builders are Messrs. Dunkin & Sons, of Camborne. Our readers will acknowledge that it is a very cheap and, for the money, fairly effective building.

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ANTIQUE FURNITURE, &c.

SELDOM in a provincial town like Brighton is a collection, not only of pictures, but of museum objects and art treasures, to be found which will compare with that brought together for the late meeting of the British Association. Its influence on art as well as scientific progress will, doubtless, be productive of much good. In one of this week's illustrations, sketches are given of a few articles of antique furniture, chiefly exhibited, at Brighton, by Mr. Thomas Mutton, of Norman's Farm, Rusper, Sussex. The sofa is an exceedingly interesting specimen. Its carvings, though rude, are suggestive and characteristic of its date. The "Adam and Eve" warming-pan, with its quaint injunction, is curious, and attracted considerable attention. The spring gun belonging to Henry Willett, Esq., of Brighton, is a weapon not often seen, and deserves mention. The chess-box, with ivory carvings on its lid, was exhibited amongst a very valuable collection, lent by E. W. Cooke, Esq., R.A., which consisted of a series of beautiful examples of Italian, Mediæval, and Oriental art.—Maurice B. Adams.

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ORNAMENTAL TREE PLANTING.

DO not, says the *Ohio Farmer*, plant treees directly in front of the house. The ground here, especially the central part, should be in grass alone, kept neat and smooth by frequent mowing. A few flower beds may be cut in the sod, near the dwelling, or by the side of the pathway, and a few trees and shrubs set irregularly near the fence, to give shade and shelter, and still more at the side of the house, especially where they will screen from view the backyard, stable, &c., and form a background to the view of the premises from the street.

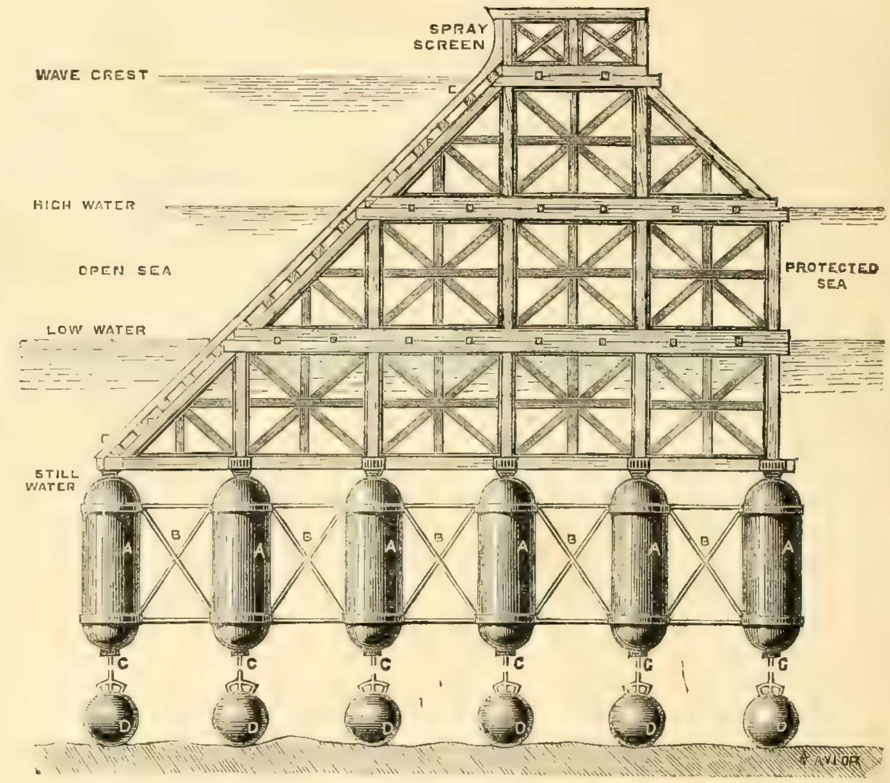
Do not plant so many trees about the house as to exclude the sunshine. Too much shade is a common fault with the older class of residences, and careful observation will show that families in such houses are much more liable to sickness than those living in houses where sunshine and air have free scope. Modern science has done good service in teaching the value of sunshine and dry earth as disinfectants or preventives of disease. The greatest improvement could be made in the looks as well as healthfulness of many good residences of the older class by the free use of the woodman's axe.

Do not plant large growing trees in small yards, nor tall growing trees near low dwellings. Most of our village door-yards are quite small, and when filled up, as is often the case, with a few large trees, they appear far more diminutive than they would if planted with shrubs or dwarf trees; and the low stature of our older style of houses is doubly conspicuous where tall trees are seen towering higher than the cornice. For small yards and for cemetery lots the dwarfish and slow-growing evergreen trees are most appropriate, and quite a variety of these can now be had at all good nurseries; but such kinds as the Norway spruce and Austrian pine, heretofore too commonly planted, should be only used in large grounds, and for screens and wind breaks. But those who already have these and other free-growing trees planted in small lots, can check their growth and improve their premises by removing them from a central position to one side; or, if too large for removal, by cutting off the top and clipping the sides annually, and, if too thrifty, cutting off some of the roots.

Do not plant or tolerate apple or peach trees in the front yard. Pear and cherry trees are more symmetrical, and a few of these may be allowed on the side of large front grounds, but the apple and peach usually look shabby, and should occupy back premises with the cabbage and currant bush. Good residences are often rendered unattractive to an eye of taste by old gnarled apple trees, standing as grim sentinels, where should be cheerful evergreens and smiling roses.

A SEA PACIFICATOR.

THE illustration given below represents a patented invention of a form of construction for ocean-shields, breakwaters, piers, harbours, gun-banks, lighthouses, and other marine objects, provisionally registered, April, 1872, though based on a principle entered at the Patent Office in 1868. That principle will be readily understood by considering the action of a float and weight connected by a line and thrown into deep water. If the buoyancy of the float equal 9lb., and the weight only 8lb., the float will not descend below the surface, but the weight will depend at the length of the line beneath. If, however, the weight be 10lb. it will descend to the bed of the water, and the float will be stationary at the same distance above. The next noticeable property is that its buoyancy is not impaired by submergence, and it resists further depression with the original force of 9lb. (There is analogy to the captive balloon.) A point of support is here obtained that may be available for structural purposes in deep water, especially for erections of stability where great comparative cost and other circumstances preclude more solid and regular construction. The agitation of the sea in British regions is supposed to be limited to a depth of about 15ft., therefore a platform at that distance below the surface would be undisturbed by wave commotion. Such a platform is presented by the tops of a series of vertical cylinders of great buoyancy, kept in their position by struts and braces, and held down to the proper level by weights or anchors. The immobility of the framework must depend on the smallness of its solids relatively to the supporting base, and would, perhaps, be promoted by the employment of iron instead of timber as here suggested.



A A, air-tight cylinders; B B, strutting; C C, cables; D D, weights at the sea-bed. From the motionless foundation thus formed the framing rises through the section of tidal and superficial action. The sloping screen formed by the timbers E E and F F presents meshes to the waves, by which their force is arrested and their effect destroyed.

The invention is by Mr. Thomas Morris, architect, Carlton Chambers, Regent-street, London.

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The Scotgate Ash Stone Company.—The diminished cost of delivery, and the ready transportation of large-sized stones achieved by the efficient working of the self-acting railway incline at the Pateley Bridge or Scotgate Ash stone quarries, are attracting considerable notice. The demand for the stone has increased to such an extent that Mr. Samuel Trickett, of Millwall, is now organising a company for the purpose of further developing the quarries, and erecting machinery to work the stone on the spot. With the advantages available, the undertaking promises to yield a very good return.

BECKET'S SHRINE.

AT the present moment, when an exceptional interest attaches to this magnificent structure, a few facts concerning it are worth noting. The translation of Thomas à Becket's remains to the "shrine," in the Chapel of the Holy Trinity, was made with great pomp and ceremony in A.D. 1220, just half a century after the archbishop's assassination. Erasmus, who wrote at the time of the dissolution of the monasteries, in describing the appearance of the shrine, says, as an eye-witness of its magnificence:—"They drew up a chest or case of wood, which enclosed a coffin of gold, together with inestimable riches, gold being the meanest thing to be seen there. It shone all over, and sparkled and glittered with jewels of the most rare and precious kind, and of an extraordinary size, some of them being larger than the egg of a goose. When this was displayed," adds Erasmus, "the prior, who was always present, took a white wand, and touching every jewel with it, told aloud the name, the value, and the donor of it; for the chief of these ornaments were the gifts of monarchs." Concerning one of these precious stones, a large carbuncle, presented by Louis VII. of France, and supposed to be the finest in Europe at that time, a curious legend is handed down. It is stated that the King (Henry VIII.) was unwilling to part with so great a treasure, but that the stone leaped forth from the ring in which he wore it, and fastened itself firmly into the shrine—a miracle against which, of course, there was no striving.

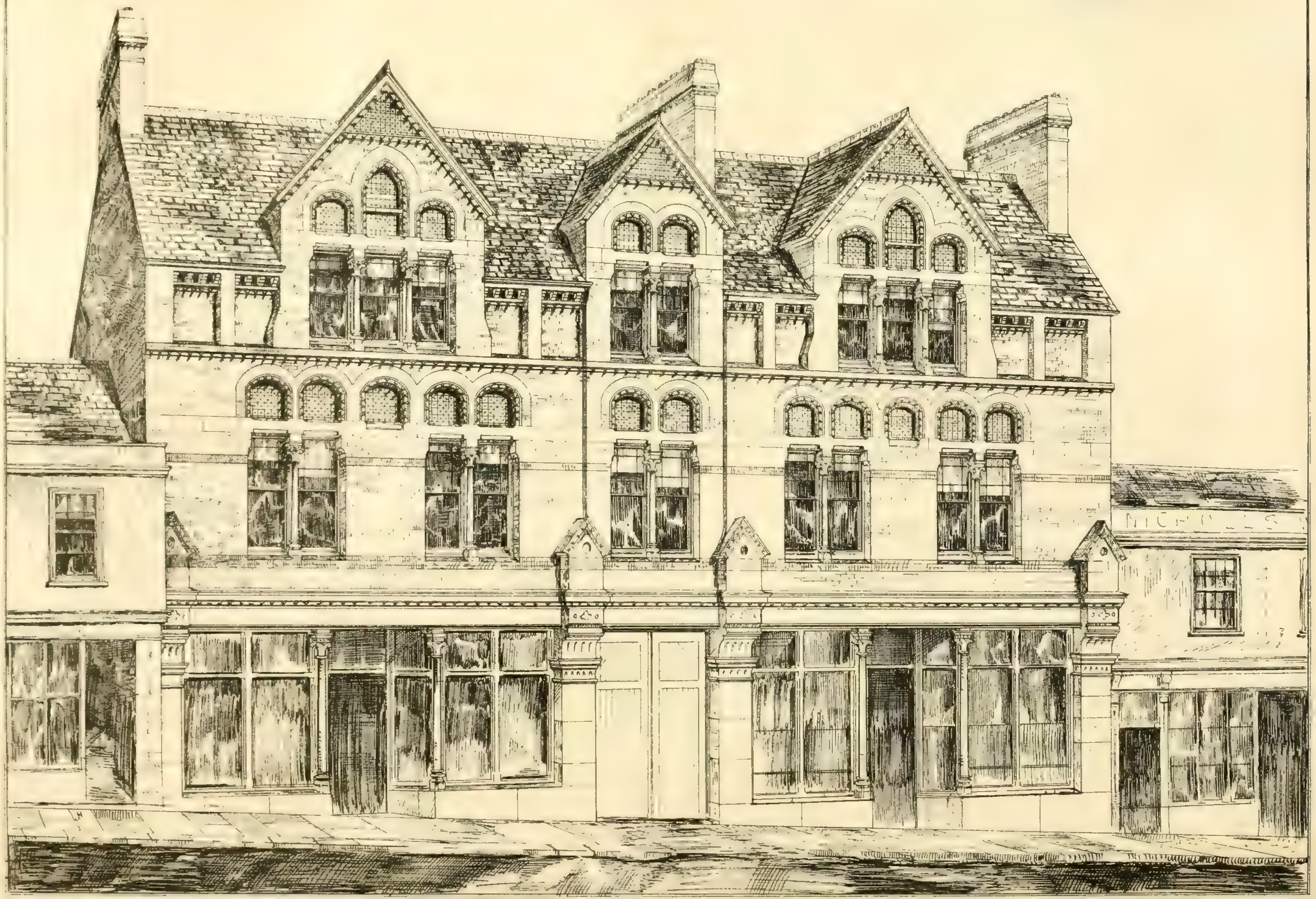
It is added that "the stone would suffice in value for a king's ransom, and that at night it burnt like fire." Honest old Stow, the chronicler, put on record the following description of the shrine itself:—"It was builded about a man's height all of stone, then upward of timber plaine, within the whiche was a chest of yron containing the bones of the Archbishop, skull and all, with the wounde of his death and the piece cut out of his skull layde in the same wounde. . . . The timber work of this shrine on the outside was covered with plates of gold, damasked with golden wyer (*sic*), which ground of gold was againe covered with jewels of gold, and rings, 10 or 12 cramped with gold wyer into the saide grounde of gold, many of those rings having in them stones, broaches, images, angels, pretious stones, and great orient pearles. The spoil of this shrine in gold and pretious stones filled two great chests, such as six or seven strong men could doe no more than convey one of them at once out of the church." It may be added, on the authority of Mr. E. W. Brayley, in the volume of the "Beauties of England and Wales" descriptive of Kent, that before the Reformation the shrine was regularly attended and watched by a clerk and other retainers, and that the offerings made at it were duly entered and registered in a chronicle by persons set apart for that duty.

SHOPS IN CAMBORNE.

CORNWALL.

PROPRIETOR MR. W. SHAKERLEY.

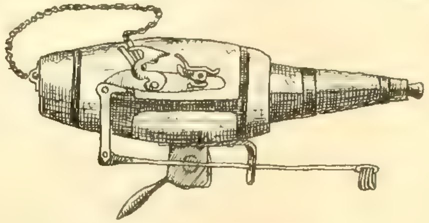
ARCHITECT: JAMES HICKS.
REDRUTH.



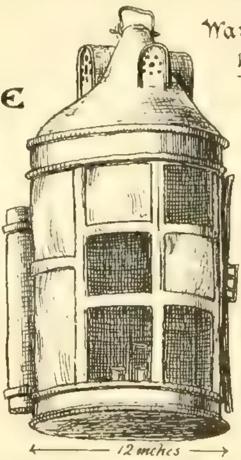
ANTIQUE · FURNITURE · &c

EXHIBITED · IN · THE · LOAN · MUSEUM · AT · THE
BRITISH · ASSOCIATION · MEETING
BRIGHTON 1872

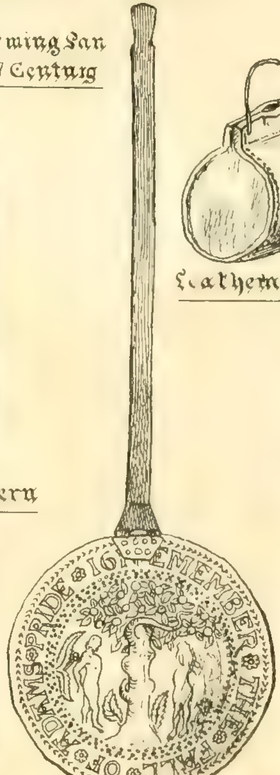
SKETCHED BY PERMISSION OF THE OWNER MR THOS: MUTTON



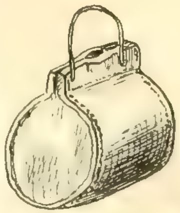
Sussex Spring Gun



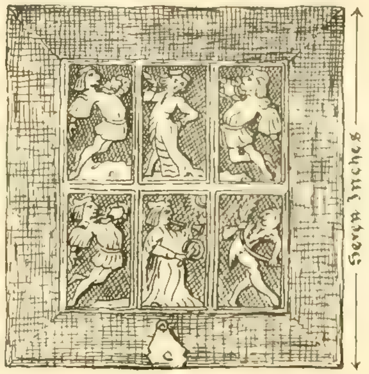
Old Sussex Waggoner's Lantern


REMEMBER THE FALL OF ADAMS PRIDE 16

Warming Pan
17 Century

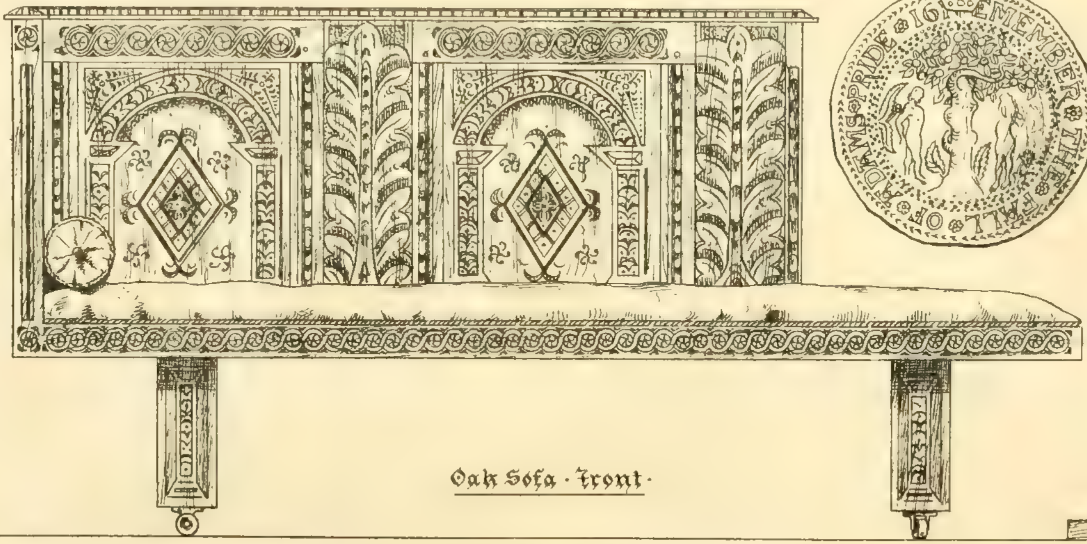


1700
Leathern Water Bottle



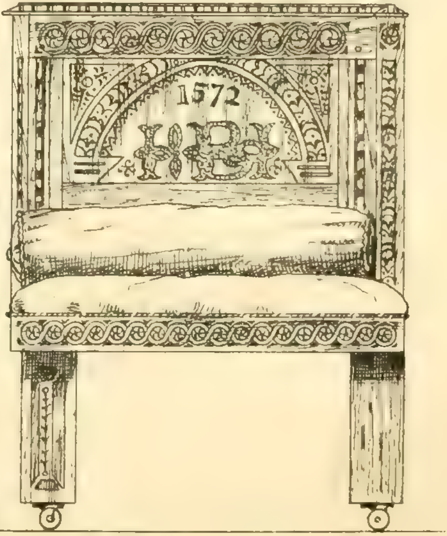
Illustrating Morris Dancers

Chess Box
15 century
From the Pourtales Collection
Paris
The property of E. W. Cooke Esq R.A

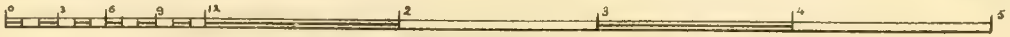


Oak Sofa · Front ·

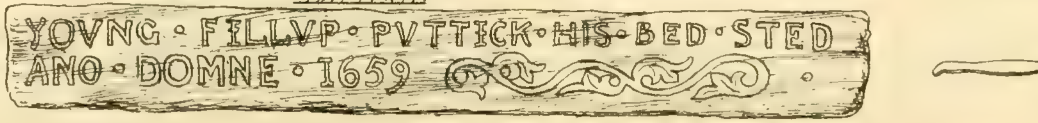
Rush Holder 1750



Oak Sofa · End



Scale of Feet


YOVNG · FILLVP · PVTTICK · HIS · BED · STED
ANO · DOMNE · 1659

Portion of an oak bedstead

Bacon Toaster 1650

Tinder Box 1700

MAURICE B. ADAMS DELT. AUG · 1872

SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.

THE twenty-fourth annual meeting of the Somersetshire Archæological and Natural History Society was opened at Taunton on Tuesday, under the presidency of Mr. E. A. Freeman. The election of Mr. W. A. Sandford, as president for the ensuing year, was proceeded with, and that gentleman then delivered his inaugural address. He remarked that three great works of repair of their ancient monuments were approaching completion. First, the west front of their Cathedral was sufficiently advanced to enable them to judge somewhat of the effect. He must confess that in some respects this was at present disappointing. Whether it were that the beautiful warm gray tint of the old work, harmonising with the dark shafting, produced an effect of dignity and grandeur which was, to a great extent, lost by the new pale blue shafts, and the mealy appearance caused by the repair of the freestone work, he knew not; but certainly the effect of the upper part of the front was not satisfactory. The pale blue shafts mixed with the colour of the sky, and produced positive gaps to the eye, where they should present support, and a shadowy unsubstantial look was given, which, he feared, would prevent those of this generation at least who from this time saw the Cathedral for the first time from realising the noble grandeur which distinguished that fine, though it be scenic and unstructural, effort of Mediæval art. In the next place the fair form of the spire of S. Mary Redcliff pointed heavenwards over the bustle and commercial activity of the great city of which its parish formed a virtual portion. It was a noble finish to a noble work of repair, honestly and patiently carried on through many years. The stone ceiling of the great church of S. Peter, at Bath, was worthy of the golden age of English vaulting. As soon as the repair of the choir was complete, and the communication between it and the nave was opened, that church, late though it were in date and style, would present one of the most complete and uniform interiors in England; in some respects to be compared with that masterpiece, King's College Chapel, at Cambridge, though, of course, of less span and general grandeur of effect. When so much was good, it was hard, perhaps, to find fault, but he thought the most uncritical eye could not be otherwise than disgusted by the ludicrous gaselier, as he thought it was called, that disfigured this noble church. It was so large, so hideous, and so entirely an incumbrance, that he hardly could write words strong enough to condemn it, as every one would in the exact proportion that he admired the remainder of the work. With regard to their own tower of S. James's, it would cease to be a reproach to the town, and Taunton had within the memory of those living restored and repaired more monuments of historic interest than any town of its size he knew. S. James's tower would rise in simpler, yet perhaps more graceful emulation of S. Mary's. While on the subject of architecture, he would say a word on the preservation of the exquisite bits of village architecture which still lingered in the nooks and corners of the country. None of them were of very ancient date, and they nearly all so admirably harmonised with the scenery in which they occurred, that one would have supposed that this ought to have sufficed to secure them from destruction at the hands of educated restorers. But so vitiated was the taste of most of the town architects, that the first thing one of them did to give plans for the repair of the village church was to recommend to the unsophisticated and astonished country parson to destroy these loved and simple beauties, and replace them with polished shafting, elaborate mouldings; and when he in his humility remonstrated, he was told that it was necessary to leave the mark of the age on the restoration. A twelfth century church, with its beautiful traceried windows, its massive oak beams and thick walls, had entirely disappeared within the last few years, and within a few miles of that place, to make every bit about as ugly and unsubstantial a structure as ever he set eyes on. And that by the advice of celebrated architects. The same thing went on all over the country. From archæology the passage was easy to that period which might be considered to belong either to that science or to its kindred science, geology. The President then referred to antiquities in reference to the origin of man, and expatiated at some length on many geological peculiarities.

Mr. G. T. Clark followed with a paper on Taunton Castle, in which he said that structure stands upon one of the many low hummocks of gravel, often with a face of red marl, which rise out of the extensive fen lands of that singular district, and which, before agriculture drained the marshes, was even more inaccessible—in military phrase, stronger ground—than even the hill fortresses of the upper country. Upon the right bank of the Thone, the river whence the town derives its name, the celebrated leader and lawgiver of the West Saxons was reported to have established himself in 702, while engaged in securing his frontier against the Western Britons, who still maintained a footing in the border ground east of the Tamar, and among the Brendon and Quantick Hills, holding probably the camps which still remained but little altered by the lapse of 1,000 or 1,100 years. That seemed to have been the origin of the town of Taunton. In the sequel of his paper Mr. Clark gave some interesting particulars relative to the castle of Taunton.

Soon afterwards the castle and the churches of the town were visited by the members of the society. In the evening there was an ordinary at the London Hotel, and subsequently a meeting was held, when papers were read.

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THE NEW FLOWER MARKET, COVENT-GARDEN.

ONE of the most pleasing pieces of street architecture that has of late been erected is the front to the New Flower Market, Covent-garden. There is in it nothing particularly striking in the way of originality of design, but there is an absence of that affected quaintness which finds such apt interpretation in the hands of some of the violent Gothic men of the present time. To say that the great merit attaching to the main front is the boldness of its lines is to indicate its exception to the prevailing fashion of the day, which is either to destroy all repose and create confusion by overloaded rococo work, or to disgust by the absurd and idiotic employment of the worst features of the worst period of Mediæval architecture, wrought out at the hands of probably the worst exponents of the style that the age has seen. The New Flower Market runs east and west adjoining Tavistock-street, and the main entrance is in Wellington-street, Strand. The eastern elevation is divided into three bays by bold and well-proportioned openings, with semicircular arches. The archivolts are of red terra-cotta—the outer face entirely so, the inner face with the voussoirs alternated by stone. Each arch has a projecting keystone, the centre one ornamented by a crown and the initial B; above these arches is the cornice—the bed-mould and medallion trusses of red terra-cotta, the corona of stone. In front of each truss is a carved acanthus leaf, and between each a sunk square panel; the elevation is terminated by a balustrade of stone, and, strange to relate, the balusters are of good profile. The spandrels of the arches and the piers are faced with white bricks, and in front of the building there is an iron railing of good design. The iron-work inside is especially worthy of notice for its excellent detail, and too much praise cannot be bestowed upon the structure as a whole, which is characterised by fine and bold proportion, carefully thought-out detail, honest and good construction, and is one that is in every respect creditable to the architect, whom we believe to be Mr. Rogers, of the firm of Messrs. Cubitt, by which firm the work has been carried out. W. W.

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THE INFLUENCE OF LINES OF METAL IN BUILDINGS IN DETERMINING THE DIRECTION OF DISCHARGES OF LIGHTNING.

UNDER this head we gave (January 26, 1872, p. 67) a report of a paper read before the Manchester Literary and Philosophical Society by Mr. Henry Wilde. The paper had particular reference to the destruction by lightning of Crumpsall Church, near Manchester. We take the following comments from a paper by E. E. Quimby, written for *Van Nostrand's Magazine*:—

The lightning-rod business, so-called, in the United States, is (says Mr. Quimby) pursued by a large class of itinerants, who not only evince gross ignorance of electrical science, but frequently practice the most unprincipled rascality. A few practitioners, who have studied the subject philosophically, pursue the business as a profession, not selling lightning-rods as an article of merchandise, but administering them, or, in other words, prescribing their arrangement and personally supervising their application to buildings, precisely as regular physicians prescribe for their patients. Among the latter class, the practice of connecting the lightning-rod with lines of metal within the building, such as line shafting in mills, or gas, water, or steam pipes, has been carefully observed for nearly forty years. In connecting with a lead pipe, care is taken to secure a considerable area of surface contact, to prevent the pipe from being melted by lightning at the point of junction with the rod. This precaution must be especially important in England, where lead pipes are sometimes used for the gas service.

The solution of the practical problem, how to protect a given building from lightning, is governed by the consideration of that invariable law of electricity which determines the selection by a discharge of lightning of the path of least resistance.

Damage ensues within a building where lightning passes from one good conducting substance to another through an intervening imperfect conductor. If the detached masses of conducting matter are linked together by the introduction of conducting substances between them, the missing links, as it were, in the chain are supplied, and a path is established upon which a discharge of lightning can pass without causing damage. If, instead of seeking out the various metallic substances in a building and connecting them together, a parallel line of conducting matter of sufficient capacity is established. the same result is accomplished. But the building occupies a very short section of the track of a discharge of lightning, while the gas and water-pipes within it communicate with systems of underground mains of perhaps miles in extent. The perfect connection of the lightning-rod with such pipes, therefore, is an indispensable requisite to the establishment of a complete path for the discharge of lightning.

To secure absolute protection from lightning, the rod must be so arranged as to present, either in itself or in conjunction with masses of metal about the building, continuous lines of conducting matter, which, relatively to the building and its contents, constitute the paths of least resistance in any and all directions, and in all the various circumstances and conditions under which the building may be exposed to the effects of lightning.

A discharge of lightning has a fixed destination; it occurs because of the juxtaposition of two bodies or masses of matter which are oppositely electrified, and its course lies between them. It invariably selects the shortest attainable path upon the best conducting matter present. It is, perhaps. made up of the electricity of a cloud thousands of acres in extent. The entire cubic contents of a building constitute but an insignificant fraction of the mass of matter affected by the electrical disturbance and contributing to the discharge. So far, therefore, as regards by far the larger portion of the discharge, the building is merely an incident in its path, and the function of the lightning-rod is simply to present the superior line of conducting matter in all directions. The ground connection of the rod must be with the best conducting material which may be present. If it is a gas or water main, with that; if a stream of water, with that; if merely moist earth, then with that. The terminations of the rods must penetrate the earth below the building just as they must project above the building, so that the rod may be ready to receive the lightning from whatever quarter it may come, and to carry it off to whatever direction it may tend.

A portion of the discharge is required to restore the equilibrium of the building itself, which, in common with all other matter in the vicinity, is in a state of electrical excitement, induced by the proximate thunder-cloud. It is, therefore, essential that the lightning-rod should be established in the most intimate connection with all parts of the building, and especially with considerable masses or lines of metal about the building, so that the electricity required to restore its equilibrium may be taken from or communicated to it in so many different places at the same time, and in such small quantities as to be nowhere sufficient to produce any mechanical disruptive effects.

The conducting capacity of a rod depends upon the extent of its solid cross-section. Increasing its surface by flattening it out, increases, if anything, the resistance which it opposes to electricity in motion. Rods made of twisted, corrugated, or tubular sheet metal, are also inferior to a solid bar, because they are less substantial and less capable of durable application. There is no occult power in the lightning-rod itself, whatever may be its form or its material, which makes it a sovereign specific against damage by lightning. Mr. Wilde recites an instance of the destruction of a church by a discharge of lightning, which left a copper rod for an iron gas-pipe.

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A recent invention for the prevention of rust in steel is being applied by Messrs. Yates, Heywood, & Co., of Upper Thames-street, to stoves and other articles of their manufacture. The process when finished leaves the surface of the steel most beautifully polished, and damp or water appears to affect it no more than it would an ordinary piece of glass. The extra cost is very trifling, and the surface of the steel is capable of being easily kept to its original brilliancy.

THE STRENGTH OF BRICKWORK.*

(Concluded from page 129.)

HAVING thus briefly reviewed a small, though for the present purpose a sufficiently large, portion of the mass of information in existence bearing upon the strength of brickwork, a little space may usefully be devoted to the consideration of the practical inferences which may be drawn therefrom. In an early part of this paper it was premised that to an intelligent and thoughtful observer a mere walk through the streets, and an inspection of the buildings erected or in progress, would suffice to prove that brickwork was possessed of many other valuable properties besides that of the simple power to resist a thrust. The evidence subsequently advanced has all tended to justify this conclusion, and if proper use be made of the data now at hand, in no case will theory and practice be found at variance. The speculative builder's apparently fatuous mistake in neglecting to put in a massive abutment wherever he introduces an arch, will be seen to be no mistake at all, but simply an unconscious adherence to theoretical principles, since as a matter of fact he is not dealing with an arch, but with a brick beam which gives no horizontal thrust, and requires no abutment. In the same manner, the firm belief entertained by most practical builders as to the sufficiency of almost any piece of iron joist that may come to hand to carry a brick wall of any height across openings of the size ordinarily met with in their practice, admits of scientific justification; whilst on the other hand the belief entertained by our typical young engineer fresh from King's College, that the bending action upon such a joist would be that due to the entire weight of the mass of super-imposed brickwork, can be shown to be utter and indefensible nonsense.

Probably few engineers would fail to smile at the suggestion that they should line their tunnels when carried through solid rock with ten or twenty, or whatever number of rings of brickwork might be found necessary to sustain the mass of rock overhead, upon the hypothesis that it is a fluid of uniform density pressing upon the brick arch or lining, like the water upon the internal flue of a Cornish boiler. Yet if the problem to be solved be to carry a brick wall or an arch—that is to say, to construct what is in effect merely a short length of tunnel through rock, for, as our experiments show, even comparatively green brickwork possesses greater transverse strength than many rocks—there are, unfortunately, not wanting many engineers in responsible positions who base their practice upon the assumption that the whole mass of the wall will press remorselessly foot by foot upon the arch; or who are so frightened at the powers they have conjured up as to be led to assert that nothing less than massive wrought-iron girders could sustain the enormous pressure of the *fluid brick* wall with which, according to their unfortunate hypothesis, they have to deal.

The most glaring faults of a small country builder are venial in comparison with such blunders as these. He may at times select a piece of iron joist too light to carry his wall at the rate at which he is running it up, but since, as our experiments have shown, the strength of his mortar or cement will increase rapidly with age, his remedy will generally be found in propping up the joist temporarily until sufficient time has elapsed for the brickwork to develope the necessary powers for self-sustainment. As an illustration of the application of the data advanced in this paper, it may be useful to show that a lofty brick wall built entirely across a girder does not necessarily throw a greater strain upon the girder than a wall one-tenth of the height, although in the face of the experiments already recorded this may appear a self-evident proposition.

Now h being the height of the wall, t its thickness, and S the span of the opening across which it is to be carried, all in feet, and f being the tensile resistance of the brickwork in pounds per square inch, then the transverse breaking weight of the wall as a beam in cwts. distributed over the entire span will be:

$$\text{B.W.} = \frac{12\,h^2\,t\,f}{7\,S}.$$

But the weight of the wall itself in cwts. distributed will be equal to S t h; hence, if the wall is to carry itself across any opening it must comply with the conditions of the equation—

$$7\,S^2 - 12\,h\,f = 0.$$

That is to say, the product of the height of wall into the tensile strength of the brickwork must always be a constant function of the square of the opening across which the wall has to carry itself. The span and tensile strength being given, the minimum height of wall to be self-supporting will be—

$$h = \frac{7\,S^2}{12\,f}.$$

If the height of the wall be less than that indicated by the above equation, an arch or a girder must necessarily be provided to carry some portion of the weight of the wall.

For any height not less than h, the portion of wall which will be self-sustaining will, since the weight is proportional to h, and the strength to h^2, be the fraction $\frac{h_1}{h}$ of the entire weight, and of course the fraction coming upon the arch or girder cannot be less than $1 - \frac{h^1}{h}$. Hence the greatest stress imposed upon the girder will obviously occur when $\left(1 - \frac{h^1}{h}\right) h^1$ is a maximum, that is to say, when $h_1 = \frac{1}{2}\,h$. Expressing h_1 in terms of h, the load upon the girder in terms of the entire weight of wall of the height h will be equal to $h_1 - h_1^2$. This, as already shown, will have a maximum value when $h_1 = \frac{1}{2}\,h$, and will then be equal to $\frac{1}{4}$th; hence it appears that the height of wall producing the severest stress upon the girder will be equal to $\frac{7\,S^2}{24\,f}$, and that one-half of the weight of the wall will then be self-supporting and one-half require extraneous support.

It follows from this that the probable maximum stress induced upon a girder by a wall of *any* height will not exceed that resulting from a distributed load in cwts. equal to:

$$\tfrac{1}{2}\,\frac{7\,S^2}{24\,f}\,S\,t = \frac{S^3\,t}{7\,f}.$$

There is no pretence of theoretical exactness in the preceding deductions; indeed, in the absence of exact data on certain points, any attempt at refinement would have served only to obscure the broad truths which have been elicited in a simple form, and with a sufficient degree of accuracy for present purposes. The last deduced expression for the maximum stress upon a girder loaded with a solid brick wall is strongly at variance with the ordinary engineering hypothesis of a *fluid* brick wall, but singularly confirmatory of the speculative builder's ordinary and successful practice. The builder cares little or nothing what the height of his walls may be, but he has a wholesome horror of large openings. The preceding equation shows that except for very limited heights, the height of wall does not enter into the consideration at all, whilst the necessary strength of girder varies as the fourth power of the span. Again, the *rationale* of the builder's practice of temporarily supporting a beam which has proved to be rather too weak during the carrying up of a wall is now evident enough, since the stress upon the girder has been shown to vary inversely as the value of f, and that value, as the experiments cited show, increases rapidly as time is allowed for the mortar to set. Thus, assuming a 14in. party wall, not supporting any floors, has to be carried across a 15ft. opening, upon a 12in. square baulk of timber capable of supporting a distributed load of 173 cwts, without undue deflection, then sufficient time must be given, either by carrying the wall up slowly, or by supporting it during construction, for the mortar to develop a tensile strength in pounds per square inch equal to:

$$f = \frac{15^3 \times 1\frac{1}{6}}{137 \times 7} = 3\tfrac{1}{4}\text{lb.}$$

The load of 173cwt. upon the span of 15ft. would be equivalent to that of a 14in. wall 10ft. in height; hence, the maximum stress upon this girder would occur when the wall was carried up to a height of 20ft., whilst at a height of 40ft. the wall with the given strain of 3¼lb. per square inch, would be self-supporting.

The same result would, of course, have been obtained for the previous equation, in which the minimum height of wall capable of self support was shown to be:

$$h = \frac{7\,S^2}{12\,f},$$

whence, by substitution, $h = 40$ft., as before.

If, as in practice is almost invariably the case, the wall be carried up during many successive days, the strength of the mass of brickwork will not be uniform, but be a maximum at the bottom of the wall, and gradually diminish towards the top. In such a case the value of f may be taken as one-half of the tensile strength developed in the mortar at the base of the wall; hence, in the case selected for illustration, sufficient time would have to be given for the tensile strength and frictional resistance of the brickwork and mortar to be equal to a stress of about 6½lb. per square inch, or the timber beam would show an undue deflection.

Many other illustrations might be given of the useful practical information deducible from the data advanced in this paper. When arches subjected to an unequally distributed load are under consideration, the question of resistance to a bending moment is often of vital importance. Much surprise was expressed at the time at the comparatively enormous strength of some narrow strips of brick arches about 15ft. span, and only 4½in. thick, tested by Mr. Fairbairn by the application of a concentrated load at the centre; but there were no just grounds for surprise, since the behaviour of the arches was entirely and simply consistent with the facts and theory referred to in the preceding investigation.

In conclusion, it may be well to reiterate the fact that the object of this paper has not been to dictate to the engineer any precise and absolute value which should attach to the inherent transverse strength of brickwork, but merely that he should never omit to include that element in his calculations. The engineer must in this, as in other instances, consider each case upon its own merits, and act accordingly, without attempting to save brain-work or to shirk responsibility at the expense of his clients' pockets. Where, as in problems of the nature now under consideration, the data are imperfect, and the effective supervision of the work during execution is of paramount importance, it is quite legitimate on the part of the engineer to provide for the maximum *possible*, as well as the maximum *probable* stress, which could take effect upon his structure. In the present case, if the arch or girder were proportioned to sustain the maximum *possible* stress of a "fluid" brick wall without exceeding the elastic limit of the material employed, and the maximum *probable* stress, according to the principles advanced in the preceding investigation, without exceeding one-fourth of the ultimate strength, the engineer would have no cause for anxiety, and yet would effect a considerable reduction in the cost of many of his works, as compared with others of a similar nature based upon the ordinary unsatisfactory and unscientific practice. It may be taken for granted that in the long run the interest of the engineer will prove identical with that of his client. A few carefully-matured designs well carried out, with a strict regard to economy, will bring more fame to the engineer than a cartload of vain conceptions, since—in the incisive language of Lord Bacon, "Men mark the hits, but do not count the misses."

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[*] From *Engineering*.

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SCHOOLS OF ART.

Brighton.—The annual meeting of the Brighton School of Art was held on Friday last under the presidency of the Mayor. The report and financial statement were both very satisfactory, but the committee regret that the work of the school is greatly hindered by the insufficient accommodation at their disposal. The thanks of the meeting were voted to the head master, Mr. A. Fisher, for the able manner in which he has conducted the school since his appointment.

Exeter School of Art.—On Wednesday week the distribution of a number of special prizes provided by a grant from the Gilchrist fund took place in connection with this school, Sir John Bowring in the chair. From the report read by the master, Mr. Birkmyer, it appears that in consequence of the stimulus given to the students by these prizes, there has been a marked improvement in the work for the year. The advanced work, though small in quantity, is of a satisfactory character, especially the designs for Honiton lace. In this subject the school sent to South Kensington eight works: of these, seven were retained for national competition, one obtained a silver medal, one a national book prize, and a third a third-grade local prize. In one stage, however, that of painting the human figure from life, the works were few, and of an ordinary character. Mr. Birkmyer added that there were twenty-nine silver medals to be distributed over the whole country, and of these twelve had been gained by Metropolitan schools, four by Edinburgh; four other schools connected with the Potteries, at Birmingham, and with the Nottingham lace trade, where design was the special feature, obtained two each, leaving five to be distributed amongst 107 other schools. Of these Exeter had obtained one.

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A small estate near to the G. E. Railway Station, Cambridge, is being laid out in building lots (part of which has been purchased by the Midland Railway Company), the roads are being formed, and the sewers laid in, from drawings and instruction of Mr. E. Bays, architect, Cambridge.

CALCULATING WAGES.

A CORRESPONDENT of the *English Mechanic* sends the following observations on the calculation of wages:—Let a be the number of hours in a full week's work, s the shillings to be paid for it, h the number of hours actually worked; then, supposing the payment A to be in proportion to the hours worked, we have $A = \frac{h}{a} \times s$. It must be observed, however, that this formula is not suited for overtime—that is, h must not be greater than a, although it may be equal to it or less than it; overtime is, of course, as it ought to be, paid for at a higher rate. Taking a full week's work at 54 hours, and putting this value for a, we get $A = \frac{h}{54} s$. Now, the usual means of tabulating such tables is by products; this method makes the tables very long—for example, a table of products of numbers up to 50 would give 2,500 products (all not necessarily different numbers), or more than half of 2,500, if the same number was not repeated.

Now, a table of squares up to 100 requires only 200 numbers—viz., the numbers themselves 100, and their squares 100. To adapt the formula $A = \frac{h}{54} \times s$ to such a table, $A = \frac{hs}{54} = \frac{4\,hs}{216} = \frac{(h+s)^2 - (h-s)^2}{216} = \frac{(h+s)^2}{216} - \frac{(h-s)^2}{216}$. Let the squares of the numbers 1, 2, 3, &c., up to 100 or more be calculated, and, dividing each square by 216, and expressing the quotient as shillings, the fractional parts being reduced to pence, we obtain the accompanying table, calculated up to 54 hours, and wages up to 50s. a week. To illustrate its use, suppose 47 hours are wrought, and the wages for 54 hours is 38s., how much is to be paid? Adding 47 and 38 together we get 85, opposite this sum in the table is 33s. 5½d. Take the difference of 38 and 47 (no matter whether hours or shillings per week are greatest), we get 9; opposite 9 in the table is 4½d. Subtract the latter result from the former and we get 33s. 1d., correct to the nearest penny—the table is calculated to the nearest halfpenny; but if one result was nearly ¼d. too much, and the other nearly ¼d. too little, there would be an error of less than ½d. The table could readily be extended, and calculated for quarters of hours, and for every 3d. of weekly wages, instead of for every shilling. A similar table could be adapted for a week of full work, of more or less than 54 hours. The table is very compendious, and saves the trouble of turning over leaves, or finding the intersection of lines and columns. The principle might be applied to other tables.

	s.	d.		s.	d.		s.	d.		s.	d.
1	0	0	27	3	4½	53	13	0	79	28	10½
2	0	0¼	28	3	7½	54	13	6	80	29	7½
3	0	0½	29	3	10½	55	14	0	81	30	4½
4	0	1	30	4	2	56	14	6	82	31	1½
5	0	1½	31	4	5½	57	15	0½	83	31	10½
6	0	2	32	4	9	58	15	7	84	32	8
7	0	2½	33	5	0½	59	16	1½	85	33	5½
8	0	3½	34	5	4	60	16	8	86	34	3
9	0	4½	35	5	8	61	17	2½	87	35	0½
10	0	5½	36	6	0	62	17	9½	88	35	10
11	0	6½	37	6	4	63	18	4½	89	36	8
12	0	8	38	6	8	64	18	11½	90	37	6
13	0	9½	39	7	0½	65	19	6½	91	38	4
14	0	11	40	7	5	66	20	2	92	39	2
15	1	0½	41	7	9½	67	20	9½	93	40	0½
16	1	2	42	8	2	68	21	5	94	40	11
17	1	4	43	8	6½	69	22	0½	95	41	9½
18	1	6	44	8	11½	70	22	8	96	42	8
19	1	8	45	9	4½	71	23	4	97	43	6½
20	1	10	46	9	9½	72	24	0	98	44	5½
21	2	0½	47	10	2½	73	24	8	99	45	4½
22	2	3	48	10	8	74	25	4	100	46	3½
23	2	5½	49	11	1½	75	26	0½	101	47	2½
24	2	8	50	11	7	76	26	9	102	48	2
25	2	10½	51	12	0½	77	27	5½	103	49	1½
26	3	1½	52	12	6	78	28	2	104	50	1

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ARCHÆOLOGICAL DISCOVERY NEAR BRIGHTON.—Since the close of the meeting of the British Association, Colonel Lane Fox, President of the Anthropological Department of the Biology Section, has been giving attention to some of the archæological features of Brighton and neighbourhood, and on Friday week he opened a tumulus known as the "Black Burgh," between Brighton and the Dyke. The exploration demonstrated that the mound was the site of a Romano-British sepulture, worked flints, pottery, a bronze knife, dagger, copper coins, small beads, &c., having been found with a skeleton. The arms had apparently been crossed, and one of the legs was in a higher position than the other. The remains were afterwards taken to the British Association's temporary museum, and during the afternoon Colonel Lane Fox gave a brief lecture upon them.

CANTERBURY CATHEDRAL, PLUMBING, TIMBER ROOFS, &c.

LAST week we reprinted some letters from the *Times* on Canterbury Cathedral and careless plumbing. The following letters are reproduced from the same paper:—

SIR,—Can the burning of part of the roof of Canterbury Cathedral be made to teach a lesson in construction applicable for future uses?

The portion of the roof destroyed appears to have been covered with lead, which was under repair, the upsetting of a plumber's fire causing the mischief.

Lead has been very largely used on the roofs of buildings, as on our cathedrals, churches, palaces, and other buildings, old and new, public and private; the framing of the modern roof (generally a flat) being of pine timber, but in buildings of more ancient date of oak. Where such lead-covered areas of roof are exposed to the direct action of the sun's rays the wood beneath is, in time, made as "dry as tinder," and is, consequently, ready to flash into fire when exposed to such a contingency (I cannot call it accident) as that which occurred at Canterbury. A lead-covered flat, exposed to the rays of a summer sun, could not be walked over with bare feet without burning and most probably blistering the skin. Such heat, summer after summer, tends to destroy the timber even if it escapes burning. What is the remedy? Floors and roofs can be constructed "fireproof" by several well-known contrivances, such as by using wrought-iron T or double I beams, joists, or rafters, filled in with concrete. These can be used so that any temperature due to the rays of the sun will not injuriously or dangerously affect the floors and roofs, which will then, in fact, be "fireproof." Architects and engineers may reasonably be expected to learn from such incidents as this at Canterbury, and, in effecting repairs, prepare against any repetition of such danger in the future. That which has happened once, things being similar, may happen again; but men will not learn this lesson; hence we go on building and burning down, as exemplified in our theatres. It need not be a wonder that modern buildings are burnt when their construction and management are considered; but it is a wonder that they escape so long. Bricks, timber, tiles, lead, and slates are so arranged and combined in modern English houses as to render burning very easy, and it appears that even stone stairs and some forms of fireproof floors only add to the danger when burning. Lead over timber is, however, a special source of danger, as the lead melts with the fire.

Sept. 5. ROBERT RAWLINSON, Civil Engineer.

SIR,—The narrow escape of Canterbury Cathedral from destruction by fire has re-awakened in my mind an idea of the insecurity of our Metropolitan Cathedral—a theory that when first entertained might have been attributed to a desire to make the precaution I should have suggested financially advantageous. As, however, the alarm at Canterbury has revealed a real cause for anxiety for the safety of intricate and extensive timber roofs, permit me, through your columns, to advise an early application of silicate of potash (not soda) to the portions of such roofs as are or may be in danger of ignition. In using the silicate of potash a small proportion of aluminate of potash should be added. These should be mixed and applied within the hour, or the solution will gelatinise. This combination will protect the timber with a coating of silicate of alumina that would become vitreous by the action of fire and very considerably retard the progress of flame. Messrs. Hopkin & Williams, of New Cavendish-street, I think, would supply the solutions, and, I have no doubt, would give the fullest details for their use.—I am, yours obediently,

Stowmarket, September 5. SANDERS TROTMAN.

SIR,—The preservation of our cathedrals from fire is a matter of such national importance, and their safety is so grievously imperilled by the vicious system of patching up decayed roofs with solder (deservedly denounced by Colonel Wrottesley), that as I have reason to believe it is still extensively adopted by those who are charged with the execution of necessary repairs, I venture to request the insertion of the following letter, in the hope that the mode of operation recommended by Colonel Wrottesley, and now employed at Lincoln, may become universal, and that the dangerous fire-basket, which, in spite of the strictest precautions, I can never see used on the roof of a cathedral without a nervous thrill, may be for ever banished.—Yours faithfully,

EDMUND VENABLES.

The Precentry, Lincoln, September 5.

"Lincoln Cathedral, Sept. 5.

"REV. SIR,—Touching the late fire at Canterbury Cathedral, the letter of Lieutenant-Colonel G. Wrottesley, in the *Times* of this day, is worthy of being re-read, and the advice therein strictly adopted. The use of solder for mending cathedral roofs is ineffective for keeping out the rain, and, moreover, it is in the end more expensive than taking a piece of lead out that has become bad, and replacing it with new, or, more properly speaking, with recast lead.

"The method of laying on lead is to have the sheets of a reasonable size, which should never exceed 12ft. long, and the narrower they can be conveniently put in, the better the work, and the less liable to be affected by the sudden changes in the temperature. In the lining of gutters proper drips should be provided, not greater than 12ft. apart, 8ft. would be better. The mode of covering roofs is to use what is technically termed *tabs*; that is, square pieces of lead of about 6in. These are nailed on to the boarding of the roof at the meeting of two sheets, having their edges turned up about 4in. each. These edges are turned with the tabs into a roll, forming a complete protection to the roof below from the rain. The tabs used for steep roofs are more numerous than for flat ones, for the reason that the lead has a greater tendency to slide down.

"In some recasting that was done early in this year I took an account of the cost of the labour, and found that, with coals added, the cost was less than three-fourths of a penny per foot super. I am, therefore, satisfied that it is less expensive to have the lead taken off and recast whenever it becomes bad than to endeavour to mend it with solder, for with solder there is a perpetual expense and a leaky roof.

"In the restoration of the roof over the south aisle of rectrochoir not a particle of solder was used, and the other roofs, which must be repaired very shortly, I would treat in the same way.—I am, Rev. Sir, your obedient servant,

"J. J. SMITH, Clerk of the Works to the Dean and Chapter of Lincoln, under J. L. Pearson, Esq.

"The Rev. Canon Venables."

SIR,—When in applied chemistry we require either to line a wooden evaporating bath with lead, or to build a large chamber with that metal, we do not employ a fiery furnace and pot of molten solder to effect the junction of the sheets, but simply a jet of ignited hydrogen and a rod of lead. Why do architects not adopt the same plan, and thus lessen the risks of destroying our ancestral mansions and glorious old Cathedrals when engaged upon the repairs of their leaden roofs?—I remain, Sir, your obedient servant,

DAVID S. PRICE, Ph.D.

26, Great George-street, Westminster, September 5.

SIR,—I believe there is not the slightest necessity for melting lead by the clumsy process which has so nearly proved fatal to Canterbury Cathedral.

In a house I recently occupied at Rome, on some repairs being required to a leaden pipe, the workmen produced, instead of a red-hot iron and pan of charcoal, a small copper machine resembling a miniature dark lantern. From the mouth of this, on a lighted match being put into it, in a few moments a strong flame like that of a blowpipe streamed forth to the length of 2in. or 3in., which was amply sufficient to melt the lead to any extent required. I found the machine was composed of two small spirit lamps, one above the other, both full of spirits of wine; the lower one was of the common kind such as we use for tea-urns; the upper one had its opening screwed down tight, but from the top surface a little pipe not the eighth of an inch in diameter curled over the side, and was turned underneath so as exactly to meet the wick of the lower lamp. On the latter being lighted, the upper receptacle soon began to boil, and its vapour, rushing through the little pipe against the flame of the lower lamp, produced a horizontal jet of great power which lasted as long as there was any spirit left. The whole apparatus could be easily carried in the pocket. I bought it and brought it to England. On showing it to one of our plumbers he told me they were not unknown here, but seldom or never used.

This contrivance might be unnecessarily costly for the repairs of common house pipes and cisterns, but where roofs are in question, most people would gladly pay the cost of the spirits of wine to avoid the risk now incurred.—I am, &c., Σ.

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LEGAL INTELLIGENCE.

THE EMPLOYMENT OF CHILDREN IN BRICKYARDS.—PROSECUTION OF AN EMPLOYER.—At the Birmingham Police Court, on Friday last, Mr. John Bond, brickmaker, Garrison-lane, appeared in answer to a summons issued against him by Mr. W. H. Johnson, sub-inspector of factories, charging him with having employed in his brickyard, on the 30th ult., four children, each being under the age of thirteen years, for more than six and a half hours per day, and also with having employed a girl, under the age of sixteen years, contrary to the Workshops Regulation Act.—Mr. Johnson said that the Workshops Act was extended to brickyards in 1867, and, in accordance with the Act, no boy under 10 years of age could be employed in brickyards, and no boy under the age of 13 years could be employed for more than 6½ hours per day; and also by an Act passed in 1871, no girl under 16 years of age could be employed in brickyards.—Defendant, in answer to the charge, said that only two of the children had been really employed in the yard, and they worked for their parents. The others were in the yard on the occasion of the inspector's visit, but they were not in any way employed by him. They brought their parents' meals, and they stopped in the yard and did a little work for a few minutes, much against his wish.—The magistrate imposed the mitigated penalty of 1s. and costs in each of the five cases, amounting altogether to £3 7s. 6d. The full penalty in each case is £3.

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The Wesleyan Chapel at Teignmouth has recently been enlarged by the erection of new galleries, &c. at a cost of £300.

Building Intelligence.

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CHURCHES AND CHAPELS.

CANTERBURY.—It is satisfactory to know that the damage done to the Cathedral by the late fire, although very destructive so far as it extended, has done little injury to any part other than the roof. That portion of the roof destroyed is the oldest throughout the edifice, and it has long been determined to renew it. Indeed, this arrangement only failed being carried out owing to a large outlay for apparatus wherewith to heat the interior of the cathedral, suggested, we believe, to the Chapter by the late Dean. It is estimated that to repair the damage an outlay of between £3,000 and £4,000 will be required. The work of clearing away the ruins has already begun, and the work of restoration will, it is understood, be carried out by Messrs. Gaskin & Godden, builders, of Canterbury, under the direction of Mr. H. Austen, the cathedral surveyor.

EARLS BARTON.—Earls Barton Church is now undergoing restoration, under the direction of Messrs. Slater & Carpenter. The chancel is nearly completed. Its side walls have undergone restoration, and parapets of Weston and Weldon stone have been added, and suitable crosses placed on each of the gables. On the north side of the chancel has been built an organ chamber, which is connected with the chancel by a lofty arched opening, and the old Tudor window, which had to be removed, has been placed on the north side of the chamber. The old roof has been removed, and has been replaced by a high-pitched kingpost oak roof, newly-leaded. The inside of the roof is oak, panelled and moulded, set off by an oak cornice. The side walls have been stripped of the old plaster and whitewash, and have been re-plastered. The old Norman recesses have been cleansed of all whitewash, colour, &c., so that the primary tooling has not been interfered with. The old triplet chancel window has not been overlooked, and the old mullions have been taken down and replaced with a new inner arch. A stained glass window has been put in by Messrs. Bell & Almond, of London. The chancel will be used for service during the restoration of the nave. The builder is Mr. Allen, of Irthlingborough.

GLASGOW.—A new U.P. Church was opened at Glasgow on Sunday. The church has galleries on three sides, and contains upwards of 750 sittings. The vestry, session-room, and other conveniences are on the basement floor; also a large hall to accommodate 400 persons, with raised platform, and two retiring rooms attached. The design is early French Gothic, and the architect Mr. J. L. Cowan, of West Regent-street, Glasgow. The front gable has three medallion heads, life-size, of Knox, Ebenezer, Erskine, and Chalmers, executed by Mr. Wm. Mossman, sculptor. The whole cost is under £3,000.

LEICESTER.—The ground for the Howe Memorial Church, which is to be erected in the neighbourhood of Sparkenhoe-street, has been staked out, under the direction of the architect, Mr. G. E. Street. The contractor is Mr. Roberts, of Weedon, and the amount of the contract is £3,690 for the church completed up to a certain point.

MANCHESTER.—A new Wesleyan Chapel is nearly completed in Cheetham-hill-road, Manchester. Messrs. Clegg & Knowles are the architects, and Mr. Foggett the contractor. The total cost will be nearly £10,000. At the south-west corner there is a tower and spire 160ft. high. The building is of parpoint stone, with ornamental Hollington dressings. There are two galleries, and accommodation is provided for 900 persons.

PORTLAND.—The Bishop of Salisbury has consecrated the new church of S. Peter, the Grove, Portland. The edifice has been erected entirely by convict labour, the site being granted by the Lords of the Admiralty, and since formally handed over to the Ecclesiastical Commissioners. The designs were furnished by Major du Cane, R.E., surveyor-general of convict prisons. Accommodation is provided for 522 persons, and the church is intended chiefly for the warders of the prison and their families. The plan is cruciform, with semi-circular ended transepts and chancel. The church was begun in 1871, and the cost of materials has been about £1,400.

TRINITY COLLEGE CHURCH, EDINBURGH.—The restoration of this fine old church is fast approaching completion. The original apse is now ready for the groined roof, with its elaborate bosses, that have been lying so long at the foot of the Calton Hill. The architect (Mr. Lessels) has, however, encountered unforeseen difficulties in restoring the apse as it formerly existed. Many of the stones, from long exposure, are in a very dilapidated condition, particularly those for the jambs and tracery of the windows, the shafts of the piers, arch mouldings, &c.; a great number of the ornamental stones have also been carried away, so that it will be necessary to replace them with new work. An appeal has been made for funds to carry on the restoration of this beautiful and unique relic of Scotch architecture. It is to be hoped the appeal will not be made in vain.

BUILDINGS.

BARWELL, LEICESTERSHIRE. — New national schools have been recently erected at Barwell. The buildings comprise large school-rooms for boys, girls, and infants, class-rooms, porches, and cloakrooms. The materials used are red brick and Attleborough stone. The architect was Mr. F. B. Osborn, of Birmingham, and the contractor was Mr. F. Simpson, of Leicester.

BRISTOL.—Considerable progress has been made with the buildings for the new out-patients' department of the Bristol General Hospital. Mr. Gingell, the architect, expects that by January 1, 1873, the buildings will be finished. The cost will be about £8,000.

CAMBRIDGE.—The guardians of the Cambridge Union are about to erect an Infectious Diseases Hospital on an isolated spot on the border of the town, to consist of, on the ground floor, for each sex, night and day convalescence wards, kitchen, and nurses' rooms, with offices; on the first floor will be two wards, 20ft. by 30ft., each containing six beds, and an occasional ward for two beds. All wards will be ventilated by foul air flues, worked in the walls, and a continual supply of fresh air will be admitted into the wards by small inlets formed with iron hoppers covered with fly-wire at the top of the sashes. A detached dead and wash house will be provided. The whole of the works are to be carried out from the drawings and specification prepared by Mr. Edwin Bays, architect, Cambridge.

READING.—At the last meeting of the Reading Town Council Mr. Waterhouse submitted plans of the proposed new municipal buildings and town hall improvements, modified with a view of keeping the buildings within the proposed new line of Vastern-street, and with a curved front towards Friar-street. The committee approved of the plans as modified, and requested the architect to prepare a specification and advertise for tenders.

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STATUES, MEMORIALS, &c.

A BALLOT MONUMENT.—At a preliminary meeting held last week at Bristol, it was resolved to take immediate steps to raise a memorial to the late Mr. H. F. H. Berkeley, coupling with it the name of Mr. Grote.

DUNROBIN.—On Monday the Queen laid the memorial stone of a monument to the memory of the late Duchess of Sutherland in the grounds of Dunrobin Castle. The monument is in the form of an Eleanor cross, with a bronze bust of the late Duchess, and will be built of free-stone.

NEW FOUNTAIN AT PATNA, N.B.—On Monday week a new fountain, presented to the people of Patna by Major Walker, was opened with much rejoicing. The fountain consists of a basement of polished gray Aberdeen granite, with two basins, into which the water flows through two metal spouts issuing from lions' heads. Above is a moulded plinth of Yorkshire stone supporting the shaft of the fountain, which is of polished Aberdeen granite, with a moulded band across the middle, with a carved shield, and arms a lion rampant. Above the shaft is a richly-carved Gothic capital, with splayed angles, surmounted by an open corona in Yorkshire stone, carrying a carved conventional *fleur-de-lis*. The total height of the fountain is 12ft. from the basement to the top of the finial. Upon the shaft, in incised and gilt letters, is an inscription. The design was furnished by Mr. Henry H. Vale, F.R.I.B.A., Liverpool.

PENDERYN.—A costly Aberdeen granite cross, 12ft. in height, has recently been placed in Penderyn Churchyard, in memory of the late Rev. C. Maybery, who has been rector of the parish for 40 years, and an active magistrate for the counties of Brecon and Glamorgan. The Forest of Dean stone base (which is square upon plan) has small recessed red polished granite shafts at the corners, and trefoils of similar material are inlaid in the fronts of the four gablets at the apex of the cap. The circular gray granite 5in. column supporting the red granite cross has a moulded cap and base, and both are highly polished. The execution of the work was entrusted to Mr. T. D. Williams, monumental sculptor, of Aberdare, by the architect, Mr. E. H. Lingen Barker, of Hereford.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the BUILDING NEWS, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

NOTICE.

The time for sending in the drawings for the BUILDING NEWS School Planning Competition is extended to the 30th of November, 1872. For particulars, see BUILDING NEWS, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

RECEIVED.—C. S. B.—C. S. A.—Wader.—J. P. S.—J. H.—F. W. R.—Japanner.—C. C.—G. & H. T. & Co.—E. L.—C. H.—T. G.—M. B. A.—S. J. N.—W. Y.—J. P.—N. W. T.—N. B.—S. & Co.—Provincial Draughtsman.—W. B.—Governor.

E. W.—Ask through Intercommunication.

E. T. H.—It was stated last week, and is stated again this week, that the time of sending in the drawings for the School Planning Competition is extended to the 30th of November next.

AN ARCHITECT'S PUPIL.—Your letter is inadmissible. Write Sir G. G. Scott a respectful letter.

DAVID DANCE.—Something may be done in the way of competition in the line you suggest by and bye.

J. R. NAYLOR.—You can get the "Rules to be Observed in the Planning and Fitting-up of Schools" at Spottiswoode's, printers, New-street, E.C.

J. A. S.—You should have authenticated your letter, and particularly as you are severe on another writer.

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Correspondence.

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LEICESTER.

To the Editor of the BUILDING NEWS.

SIR,—The initials "E. W. G." are familiar to all readers of the BUILDING NEWS, and, in his time, the author has done good service to the profession. He has written on many subjects to advantage, and criticised most architects (himself included) and their works, with a vigour, a power, and an audacity unrivalled. Unhappily he has, in this last respect, the rare quality of looking at the world from an eminence too lofty for most men in these days to aspire to. No architecture of modern times is fit for his praise, and but few architects for centuries past have escaped his condemnation or rebuke. This, however, is quite in the nature of things, for, if in this howling wilderness of art he sees no feature to admire, no beauty, no green oasis to refresh the weary soul, even in his own free unfettered works, how impossible is it to find outside the circle of his admiring friends and followers this missing ideal! We hardly know whether "E. W. G." is centuries before or centuries behind his time. Had he lived in, and participated in rearing the splendid works of the Mediæval times, possibly succeeding generations might have been fascinated by his works, and awed by the greatness of his name. But this modern British public, phlegmatic and immovable in most things—always so in art matters—has not yet been educated up to his standard. In many of the great competitions of late years, men of eminence and large retaining fees have placed him highest on the list of competitors; but, public opinion, like that embodiment at Covent Garden Theatre, shuts its eyes to the beauty of exterior show, tinsel, or glitter, which it confounds with true and noblest art. It looks at ease, comfort, mere arrangement and convenience, as things of much greater importance, so that "E. W. G.," with his architecture always beautiful, and frequently unique, finds himself quietly shifted off the stage and pooh-poohed into the background. This is to be regretted, more especially so because there is no hope of a new order of things until this "art architect" shall pay greater respect to arrangement and internal fitness of things —qualities generally attributable to the building surveyor architect — to which, as against the art phase of the question, the true Briton has an attachment which is superb.

But Mr. Godwin has his revenge in holding up his contemporaries and rivals to popular ridicule. A great proportion of the architectural profession at this moment is, doubtless, utterly beneath the contempt of our critic, so that when he singles out a person or place for special comment, we may be sure that it is one of the few men or places not yet sunk to the deepest depths, or lost amid the mazes of mediocrity. In his fifth article, last week, on "Modern Architects and their Works," "E. W. G." makes special mention of Bristol, Plymouth, and Leicester. I have before made a few remarks on Plymouth, and I now propose to follow suit on Leicester.

Leicester should have been a city; true, it wants a cathedral and something to make it one, but its historical associations are rich and rare. The remains of Mediæval buildings are scant, save of churches, and happily all of them have not yet been restored off the face of the earth. There is S. Mary's, with more force and beauty in its work of seven centuries old than can be found in modern imitations within a day's march. S. Margaret's possesses a noble tower, a quaint porch, and fine windows in Perpendicular style. Mr. Brandon has restored the mother church, and added a lofty tower, which is somewhat heavy and cumbersome. This church is of great beauty, possessing a double nave. But it is not the old so much as the new work of which at this moment I desire to speak. The new churches are undoubtedly superior to those very "ordinary" ones peculiar to Plymouth. Mr. Scott has built no less than three; one is of brick, rich and harmonious on the inside, but the exterior is not up to his mark. S. Matthew's, by the same hand, is a church of enormous size; the east end is remarkable for the glass being set in reveal of 14in. from the wall face, with good effect. It has often occurred to me that architects forget themselves in placing the glass as near the outside face as possible. In secular buildings it is never attempted, because of the thin-skinned effect which follows.

The new church of S. Mark's, in Belgrave Gate, by Mr. Christian, is the last and best of Leicester churches. The site is commanding, the grouping effective, and the detail worked out with care. The tower is massive, but exceedingly stunted at the belfry stage. Altitude in the upper stage is always good, but from the absence of it here much effect is lost.

Trinity Church is remarkable in many ways. It is not yet complete, and is partially obscured by scaffolding; sufficient, however, is exposed to view to show the quality and nature of the design. The body of the church is almost obscured by surrounding houses, and the site has been seized to develope a novelty in church building. It has a flat warehouse roof of about 50ft. span in front, and marking which is a central tower of great size and somewhat ornate; flanking this tower are staircase turrets of good proportions. This group of buildings, seen from King-street, has a bold and striking, but withal, a chapel-like effect. The detail is not sufficiently churchy.

A Puseyite church across the Soar, the result of a local competition, is undoubtedly unrivalled in the world. I should suppose the ideas of Father Ignatius and the architect of this building are quite in harmony. The portions of the tower already built are suitable for a mountain top; the apse might stand alone on a prairie, and the church—anywhere but in the green fields of Leicestershire. There is no connection between the three, which are quite dissimilar; the architect might possibly be fit to design a bridge or a breakwater—that is to say, where everything is grotesque, hideous, horrid. How many of the competitions in late years have terminated in this way, owing greatly to the blindness and infatuation of the British public, or to their shadows, the vestrymen?

Of street architecture there is but little to admire. The National Provincial Bank is unworthy the Company and the site; the most striking features of this building are the enormous balls rising aloft the very poor dormers. Mr. Gibson was *not* the architect of this work.

A much better design, and appropriate in many respects, is the warehouse of Messrs. Hodge, by Shenton & Baker, architects. It is a building of three stories, the bottom one forms a solid base in stone, the upper portions being in brick, in the treatment of which a proper regard has been paid to the material—a quality not often found.

I now come to the works of Mr. Joseph Goddard. There is in his style an individuality but rarely found. We cannot confound his works with that of the local brethren. The essential qualities of his buildings is "prettiness." I am not so sure that he takes Sir G. G. Scott as his prophet, but if so, the knight is badly followed. Sir Gilbert can be great without being pretty, but when our lady's man is not pretty he is nowhere. A clock tower in the square is, of course, to the young and aspiring architect, the *beau ideal* of all that is lovely. It meets his ambition fully, for it is all prettiness, all show, essentially to be stared at. Inside there may be a staircase leading nowhere, and outside, there is, of course, a corresponding string-course having the same destination. At the four corners are effigies of the great men and benefactors of the place, and beneath, stopping the hood-moulds, are the visages of, possibly, the architect and his wife. This is essential to prettiness, and if the works are for the gazing throng, why not the man? There is no base, but four gates to keep away the dogs, so that the whole toy looks literally sunk fathoms into the ground.

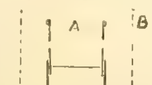
S. Mary's Schools are of the same type and character, and have no other quality than prettiness. Much "natural" carving, the effigy of a boy on the right, with a lonely buttress and polished marble shafts to support it, and, of course, the effigy of a girl on the left: these are the chief features of the design, all in parenthesis, and which might have been omitted. The side elevation does not aim at this effect, and the consequence is it is infinitely superior. Beauty will not arise by useless amalgamation of features, however elegant in themselves, and the greatest advantage which Mr. Goddard could have at this moment is a check in many of his idiosyncrasies. By far less pretentious, and infinitely superior, is the school by the same hand near S. Matthew's Church. Whether we look at his schools, his shops, his clock-tower, or his dwelling-houses, we find the same effect, the same prettiness, the same show, the same extravagance of detail, the same striving after effect, and the same errors. A little variety in this way is charming enough, but we care not to be surfeited by it.

The shops in Belgrave Gate are undoubtedly Mr. Goddard's best works; I should suppose that in this case he has been checked in expenditure, for it is not full of useless features, and there is a quiet homeliness in the façade, and a picturesqueness in the upper stage, which in street architecture generally we so sadly want.—I am, &c., H.

CANTERBURY CATHEDRAL AND PLUMBER'S WORK.

Sir,—In common with others of your readers, while lamenting the damage done to this glorious old structure, I am glad that it was no worse than it is. The plumber's chaffer-pan is blamed as the cause of the fire; now, allowing that, I should like to know what it stood upon. At p. 95 of the Building News for February 2, 1872, a sketch is given of a plumber's chaffer-pan with iron tray underneath it, which tray should be filled with water. I would ask, therefore, if such a tray was used by the plumbers at Canterbury Cathedral, and if they had water in the tray? When there is no water in the tray the heat of fire might easily make iron so hot as that dry wood below the tray would ignite. Supposing the tray rested on some level space covered with lead and wood underneath the lead, then for greater safety the tray should not only have water in it but a layer of slates, or some other non-combustible substance should be also put underneath the tray. For greater safety, also, a circular fire-screen of iron wire or gauze should be used as a safeguard to chaffer-pan, as per sketch, where A is chaffer-pan, B fire-screen, and C iron tray with about 3in. of water in it, in which water all cinders falling out of chaffer-pan are at once quenched. When working on such buildings as we are speaking of extra precautions ought to be taken, and an extra hand put on to watch fire, especially while the others were away at meal times, would surely be no great hardship in the way of expense.—I am, &c.,

Plumber.



THE NEW CATHEDRAL FOR EDINBURGH.

Sir,—The exhibition of the Cathedral designs of the three English and three Scottish architects is closed to the public, but it seems to have created a great interest in church architecture among the citizens of Edinburgh, if one is to judge by the amount of amateur criticism and correspondence to be found almost daily in the *Scotsman*, the *Edinburgh Courant*, and the *Daily Review*. None of these effusions give token of much acquaintance with either ecclesiology or architecture on the part of their writers; while, in most of them, the spirit of partisanship is ludicrously obvious. I never remember an architectural competition that has elicited, on the part of the non-professional press, so copious a discharge of unintelligent criticism. Certes, the good citizens of Edinburgh are, if we are to judge by their newspapers, hardly ripe for the adoption of universal suffrage in the matter of church architecture; and this Cathedral competition, with its pre-adjudication exhibition, has afforded a signal proof of the wisdom of at least one of the clauses of the competition regulations, lately approved by the General Conference of Architects in London—the clause that provides that the public exhibition of the designs shall not, as it often does, precede, but take place after, the award of the adjudicators. The trustees, under the will of the foundress, with whom alone rests the award, and who act in reality in only a private capacity, for the Edinburgh Episcopalians, must be somewhat disconcerted by the appeals in the local papers to adopt this or that design, for this or that municipal object. The designs will, before selection, be subjected to a scrutiny as to cost by some sworn surveyor; and we hear that the trustees' selection, on other grounds, is likely to be guided or moderated by a report from Mr. Ewan Christian, or some other architect of known experience in church building. I shall not greatly edify our own readers if I give them a *resumé* of the various criticisms of the local press. In all of them there runs a prevalent idea that the competing architects ought to have so placed their cathedrals as to orientate to the west (if we may employ the phrase), so as to face to, and be approached from, the existing finished street (Melville-street). "Rivers," we learn from Brindley, the Duke of Bridgwater's engineer, were made "to feed navigable canals." Cathedrals, we now learn, should stand so as to face and terminate finished streets. The several competitors seem very sensibly to have ignored this very grave municipal necessity.—I am, &c., S. S.

VENTILATING TROUGH JUNCTIONS FOR HOUSE DRAINS.

Sir,—I trust I may be excused expressing my disappointment at Mr. Guillaume's last letter. In mine of August 30th, in order to prevent misconception and to give the "trough junction" idea fair play, I asked Mr. Guillaume to give a drawing of his ventilated trough, showing its practical application, but, as page 190 shows, he declines to do so. Now, I am sorry for this for several reasons: First, because we have taken up a considerable amount of your valuable space, and the result has been almost *nil*; second, he asserts that I misunderstood his "trough junction." Now, supposing I do, there was all the more reason, surely, to give a sketch of it so that I might understand it, and if I, a practical tradesman, misunderstood his verbal description of it, how much more would non-practical readers be likely to misunderstand it?

As the case stands I am unable to acknowledge that I misunderstood the "principle" of it, or that I am wrong in the position I have taken up regarding it. If in saying so I do not accord to Mr. Guillaume's "trough junction" the credit it really deserves he alone is to blame, because he refuses to give me that light which might enable me to accord it. This leads me to observe, further, that it is the duty of all your correspondents to remember that they do not write merely for their own satisfaction, but for the information of all your readers, and, therefore, all correspondence sent in should be so written as that it may, as far as possible under the circumstances, be easily and readily understood by all.

Mr. Guillaume compares his trough with the style of ventilation shown at p. 392, Vol. XXII., and at once awards the palm to the trough. This appears to me to be giving away the prize before the race has been run! Now, that won't do; first give us a drawing of this wonderful trough, showing its application, and then we can all judge. I think Mr. Guillaume makes a mistake when he says that the plans referred to at p. 392, Vol. XXII., are only the ordinary method, for while the carrying up of a ventilating-pipe from top of soil-pipe may be the ordinary method, yet the *additional* ventilating-pipe shown by P P, Figs. 113 and 118, p. 392, leading off tops of syphon traps, is, so far, at least, as my experience goes, an *extra*-ordinary method. As to the idea that the gas will force itself through a properly locked syphon trap, that is a pure dream, at least, where the syphon trap leads into a ventilated soil-pipe of proper size.

I admire Mr. Guillaume's candour in admitting that his trough is only useful for water-closets in certain situations, and that it is not adapted for soil-pipes in the centre of a building; but when he adds that placing soil-pipes in the centre of a building is "a plan which no common-sense would tolerate," I am at issue with him at once, and to illustrate this I can hardly do better than call attention to the beautiful plates given with the BUILDING NEWS no longer ago than August 16, 1872, and to observe, shall we say—Well, Mr. Redding, your design, generally speaking, may show able planning and good taste, but seeing you have no less a number than about half-a-dozen water-closets in the centre of the building, that is "a plan which no common-sense would tolerate"!—I am, &c., PLUMBER.

PLYMOUTH ARCHITECTURE.

SIR,—Allow me to wind up, as far as I am concerned, my correspondence with "Quatrefoil," as the discussion is assuming a circular, and therefore an interminable, form.

"Quatrefoil" has an advantage over me in being on the spot, which I am not, and, therefore, I must be excused for referring to the non-existent buttresses of S. Stephen's as the cause of the doorway infringing on the window. But whatever the cause, I remember considering it justifiable at the time it was done, and I doubt not but that most practical Gothic architects could find an authority for it if requisite. I would also ask if he is aware why the buttresses on the south side of the tower are "corbelled out"? If he does not I will tell him, what is almost self-evident, as the temporary iron tie-rods of the interior will show, that when the south aisle is added the buttresses will be built up, and the corbelling will cease to exist. The southern wall of the nave also indicates the future aisle, which will be built on the falling in of the lease of the adjoining house. I am not aware of having in any way mentioned Ottery S. Mary Church, and on the general subject of our letters I must retain my own opinions and leave him to do the same.

With respect to your other correspondent, who seems rather to support my defence of the Devonport churches, I would ask "Three Towns," if he has not seen the plans, &c., of S. James's, Plymouth, to try and get a sight of them, when, perhaps, he will not consider my opinion of its merits very rash. My judgment of it is an independent one, and not based on the "Ecclesiologist" or any other authority, and I may add that one whose name (were I at liberty to give it) would be acknowledged as an authority second to no other, observed to me, "the church is most ingeniously planned, and the elevations very good, and if I ever find myself within fifty miles of it when finished I shall certainly pay it visit. I trust that money will not be wanting to complete it handsomely, as it deserves."

As regards Mannamead Church, I am hardly in a position to offer an opinion on it, but when I saw it some time ago as a mere shell, the two points that pleased me were the windows, which I thought very good, and the mason work, of a very beautiful stone, far handsomer than any I have ever seen in Plymouth, excepting, perhaps, the rich red stone from Bovisand, which is all but unknown in the towns as a building material, and where it is chiefly used for paving purposes. If local architects wish to see its effect let them visit Antony Church, or a lodge in Antony grounds between the house and the ferry. If I mistake not, Trematon Castle is built of it. As to the plan of Mannamead Church, it struck me as being very abnormal, not to say heterodox, but I had only a passing glance at an incomplete building.

I would also inform "Three Towns" that S. Andrew's Chapel, Plymouth, was the work of a local architect, Mr. Foulstone, and that Trinity Church and Christchurch were the work of Mr. Wightwick.—I am, &c.,
PLYMOUTHIAN.

P.S.—As my eminent authority for the merits of S. James's Church, Plymouth, may possibly be doubted in his anonymous character, I herewith give you his name, in confidence, together with my own. I must also beg to thank you for having kindly inserted my letters, of which I now send you the last.

SCHOOL COMPETITION.

SIR,—Will you kindly tell me whether we have the right of "lighting into the "yards" marked at the back of the site?—I am, &c., E. H. B.

[Answer.—Yes.]

Intercommunication.

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QUESTIONS.

[2652.]—**Northamptonshire Churches, &c.**—I shall feel obliged if any one will inform me where I can purchase the above book, and what the (if there is such a work) price of it is.—GARGOYLE.

[2653.]—**Clerk.**—Do you think it is necessary, in order that my son may become a good quantity surveyor and estimating clerk, that he should work at the bench and learn it practically?—PATER.

[2654.]—**Stoves.**—Will any reader tell me the proper way to fix one of Carrell & Bennett's stoves, made by Nock, of Birmingham? One I have fixed will not bake, although there appears to be draught enough; but in my opinion the chimney is not high enough, as there are houses and other chimneys at least 15 or 20 feet above the chimney in which the stove is fixed.—R. W.

[2655.]—**Sawing Timber by a Wire Charged with Electricity.**—Can you give me the address of the inventor of the above? I think it is Dr. Robertson, of New York. Also, where can I find an account of it in a scientific or other journal?—W. E. HUGHES.

REPLIES.

[2643.]—**Puzzolana.**—Artificial puzzolana is made of powdered brick or tile dust. In Holland they make it from burnt clay.—J. T. J.

[2644.]—**Party Wall.**—In reply to "R. L.'s" questions respecting party walls, I think the Act is explicit respecting dangerous structures, and that such dangerous structures must be "forthwith taken down, secured, or repaired, as the case requires." If such structure be a party wall, the notice from the Commissioners supersedes the necessity for all other notices, and both owners must mutually suffer the inconvenience. As to the re-erection, I imagine both owners would be glad to rebuild as soon as possible, of course equally sharing expenses. With regard to the next question, it is clear that there is no provision (exceptional) in the Act for the case mentioned, and justly so, because it would be hard for the adjoining owner (who would receive no compensation from insurance) to be inconvenienced by rebuilding and its consequent horrors because his neighbour has been unfortunate. But it is not always necessary to rebuild party walls after a fire, unless some raising or alteration is contemplated, and in that case the usual and only course is to arrange terms with the adjoining owner, which must be done when the notice has expired, in the manner described in the Act, if not arranged previously. The motive for this is evident, that the building owner may not improve without regard to the adjoining owner's rights. "R. L." will find that if he cannot arrange terms with the adjoining owner now he will be unable to do so at the expiration of the notice.—NEMO.

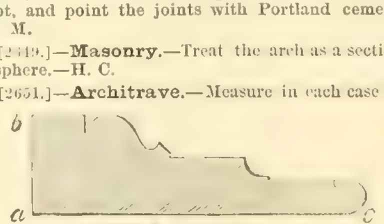
[2647.]—**Keeping Out the Damp.**—I recently tried the instanter enamel, advertised in the BUILDING NEWS, and found it the most efficient remedy possible for damp walls.—F. U.

[2647.]—**Keeping Out the Damp.**—Dig a trench on outside from surface of ground to 4in. below floor line, build a 4½in. brick-course in half Portland cement and half sand, keep every joint well flushed and pointed as work proceeds, pack on outside of brickwork 6in. thick well-prepared puddle clay.—AN OXFORD LAD.

[2647.]—**Keeping Out the Damp.**—The cure is to build a 9in. brick wall 3ft. below the surface level, and build it clear of the present one about 5in. or 6in., till it reaches within 3in. or 4in. from the surface level, and then cover it with pavements about 15in. or 18in. broad, with a fall of about a quarter of an inch to the foot, and point the joints with Portland cement.—H. M.

[2649.]—**Masonry.**—Treat the arch as a section of a sphere.—H. C.

[2651.]—**Architrave.**—Measure in each case from *a* round *b* to *c*, pressing the tape into all quirks, hollows, &c., as for painting.—H. C.



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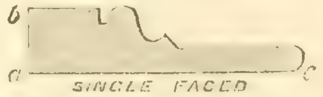

SINGLE FACED

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S. MARY OTTERY, the most interesting of all the Devonshire churches, well-known as almost a counterpart, on a reduced scale, of Exeter Cathedral, and one of the few examples of Mediæval copyism we have, is undergoing repairs under Mr. Butterfield, of London, the architect who restored the church some years ago. New parapets and battlements, with pinnacles upon the angles, are being erected upon the north and south towers; they are of Bath stone. The work is in the hands of Messrs. Digby & Son, builders, of that town.

STAINED GLASS.

BELGRAVE-CUM-BIRSTALL.—A stained glass window has been lately raised in the chancel of Belgrave church, in memory of the late vicar, the Rev. R. Stephens. The design of the window records the principal events of our Saviour's life, and has been executed by Messrs. Ward, Hughes & Co., of London. Another window has also been raised by two members of the family in the chancel of Birstall church, the subjects being our Lord's Nativity, Crucifixion and Ascension, executed by the same firm. A reredos will, we understand, be shortly raised in Belgrave church by the parishioners, from a design by Sir Gilbert Scott.

SALISBURY CATHEDRAL.—A stained glass window has lately been put up on the south side of the Lady Chapel, in memory of Bishop Burgess, who presided over the Diocese of Salisbury from 1825 to 1837, bearing the following inscription at the base:—"Ad gloriam Dei et in honoratum memoriam Thomæ Burgess quondam Episcopi de Sarum qui obitt Feb. 19, 1837, poni curaverant propinqui et amici adhuc superstites. A.D. 1872." The window, which is by Messrs. Clayton & Bell, forms part of a scheme which has been prepared for the four windows of the Lady Chapel, comprising the chief events in the life of our Lord, of which, therefore, three remain yet to be completed. Each window consists of two lights, with five subjects in medallions in each light. That recently finished contains the Marriage at Cana, His Mother and Brethren Inquiring for Our Lord, The Bearing of the Cross, The Crucifixion, The Deposition, S. John Leading the Blessed Virgin from Calvary, The Entombment, The Marys at the Tomb. The Confession of S. Thomas, The Charge to S. Peter.

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WATER SUPPLY AND SANITARY MATTERS.

TORQUAY.—In compliance with the report of Mr. Hawkshaw, the Torquay Local Board have determined to recommend to the Local Government Board the adoption of Mr. Bazalgette's plan for the disposal of the sewage of the town. Mr. Bazalgette proposes to construct a large intercepting culvert, which would prevent all discharge of sewage into the bay, and carry it by means of a subterraneous tunnel into the depths of the sea, three miles distant from Torquay, at a rocky promontory known as "Hope's Nose." The cost is estimated at £30,000.

WELSHPOOL.—Another illustration of the connection between disease and the use of impure water comes to us from Welshpool. Mr. Harrison, who has already done the town good service by directing attention to the subject, was called upon some time ago to attend a case of sickness in a tradesman's family, and all the ordinary remedies failed to arrest the disease. At length a sample of the water drunk by the family was forwarded to Mr. Blunt, who discovers that it is "strongly impregnated with sewage, and totally unfit for human consumption." This is, unfortunately, but one of a number of instances of the kind.

WINDSOR.—The royal borough of Windsor, like other towns in the Thames Valley, was served with notice three or four years ago to discontinue draining the town into the Thames. Since then a "final notice," and more recently a "peremptory notice," have been given, both of which have expired, and the local authorities may now at any time be subjected to the heavy penalties imposed by the Thames Conservancy Act. Although no steps have been taken to comply with the requirements of the Thames Conservators, the local authorities have been debating the question for years, and have had several schemes before them. In accordance with a recommendation of Colonel Ewart, who a few years ago surveyed the Thames Valley, the Board of Health employed a firm of engineers to suggest a plan for utilising the sewage by irrigation, and land in the parish of Horton, about four miles from Windsor, was selected. The scheme was estimated to cost £30,000, without including the cost of land and compensation to tenants. This being considered beyond the means of the borough, two schemes of precipitation have been considered, and the Board is now in negotiation with the Native Guano Company. Several sites selected for the erection of precipitating works have been opposed by the War Office as being too near the Spital cavalry barracks, by the residents and owners of property in the immediate neighbourhood who anticipate a nuisance, and by the Crown, as interfering with the enjoyment by her Majesty of the Royal domain. The Local Board have at length fixed upon a site, on the Ham, at Old Windsor, near the land which the Crown authorities have selected for utilising the sewage of Windsor Castle. If arrangements can be made for the acquisition of the required land, the Windsor drainage difficulty will be solved, and the work of the purification of the Thames will be so much nearer its accomplishment.

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A new warehouse is in course of erection in Corporation-street, Manchester, from the designs of Mr. James Denison, by Mr. John Wilson. The cost will be £5,000.

Our Office Table.

OBSTRUCTION OF A CITY THOROUGHFARE BY A RAILWAY COMPANY.—Complaint was made at the meeting of the City Commission of Sewers on Tuesday that the Great Eastern Railway Company had proceeded to block up Sun-street, one of the most important thoroughfares in the City. It was explained that the attempt of the Corporation to restrain the company had failed before the Lords Justices, and that the railway authorities had therefore a legal right to close the street. At the same time an appeal was pending before the House of Lords, and if the decision of the Court of Chancery should be reversed, the company would be called upon to reopen the thoroughfare and to pay consequential damages.

LEICESTER SCHOOL BOARD.—At the last meeting of the Leicester School Board plans for a school of four departments, to contain 876 children, on the Oxford-street site, were laid before the Board by the architect, Mr. W. Jackson. The plans were referred to the Architects' Committee.

PLASTER AS A PROTECTION FROM FIRE.—After the conflagration in Paris, it was generally found that, with good plaster work over them, beams and columns of wood were entirely protected from the fire. In cases where limestone walls had been utterly ruined on the outside by the flames passing through the window openings, the same walls, internally, escaped almost unscathed, owing to their being coated with plaster. On many such plastered walls the distemper decorations were still to be made out. The iron roofs rendered good service, and the party walls of each house were carried up right through the roof—a most important precaution, for otherwise nothing could have prevented the disastrous conflagration from being more extensive than it was. It was also fonnd that good woodwork in beams and posts, good wood floors, well pugged, and good wooden staircases, were safer and more to be depended upon than cast-iron columns and stone staircases, landings, and floors. Stone staircases well protected by plaster were fireproof, although not so safe as wood in case of heavy *débris* falling upon them.

SAYE'S COURT TRANSFORMED.—The old historic site of Saye's Court, remembered through its associations with the ancient family of Evelyn, and as a residence of the Czar Peter during his stay as a shipwright at Deptford Dockyard, is now undergoing a transformation, eight of the fifteen acres of vacant ground around it having been set apart as a public recreation ground for the use of the people of Deptford. Mr. W. J. Evelyn, the present representative of the family of the author of the "Diary," has generously borne the expense of clearing, draining, levelling, and preparing the land for its ultimate purpose, and recently visited and inspected the works now in progress, which are under the superintendence of Mr. Evelyn Liardet. It is understood that should his gift be used in a manner satisfactory to him, Mr. Evelyn will probably allow the remaining portion of the ground to be used similarly. The old Manor House of Saye's Court is to be restored, and will be an interesting object to future visitors, the remains of an old tree planted by Peter the Great being still shown near it, in a portion of what was once the garden of Saye's Court.

HEAVY FAILURE IN THE BUILDING TRADE AT MANCHESTER.—A meeting of the creditors of Mr. John Christie, of Higher Broughton, Manchester, builder and contractor, was held last week at the offices of Mr. J. Dewhurst, solicitor, Victoria-street, when a statement of the debtor's affairs was submitted to the meeting by Mr. J. Dawson, accountant, showing bills and open accounts, £1,432 0s. 1d.; to creditors fully secured by mortgages, £11,961 9s. 2d; total, £13,393 9s. 3d. Assets (including estimated value of property finished and unfinished), £15,752; surplus of assets over liabilities, £2,358 10s. 9d. The proposal of Mr. Christie to pay 20s. in the pound by instalments in four, eight, and twelve months was accepted by the creditors.

TO SOFTEN PUTTY.—To remove old putty from broken windows, dip a small brush in nitric or muriatic acid (obtainable at any druggist's), and with it anoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hour's interval, the putty will become so soft as to be removed easily.

EMERSON has had his house at Concord burnt down. It was built for the family fifty years ago, and contained a valuable library and many precious articles of *virtu*. These have been saved, and the house is to be rebuilt by the great essayist's friends. It is sad to know that Wordsworth's house has been "improved" until scarcely any of the original building is left.

CHIPS.

For upwards of two years the fifth bell of the church peal at Chagford has been cracked. It has now been recast and hung in the tower by Mr. W. Aggett, church bellhanger, Chagford.

The township of Morley-cum-Churwell, near Leeds, has adopted the Local Government Act.

The Town Council of Sheffield has appointed a committee to consider and report on the desirableness of appointing a medical officer of health and analyst under the Act for the prevention of the adulteration of food, drinks, and drugs.

Extensive alterations have been made at the Theatre Royal, Exeter. The style adopted for the decorations is the same as that of the Gaiety Theatre, London, of which Mr. C. J. Phipps, F.S.A., was the architect.

The inhabitants of Gillingham, near Rochester, have decided to adopt the Local Government Act of 1858.

The chancel of All Saints' Church, Sonning, has received the addition of a reredos, consisting of seven canopies worked in Bath stone, supported on columns of Devonshire marble.

At the meeting of the Burnley Board of Guardians, on Wednesday week, tenders for the new workhouse were accepted, as follows: Mason's work, £10,000; joiner's, £3,244; slater's, £627; plumber's, £505; plasterer's, £549; painter's, £161; total, £15,000.

The new (Roman) Catholic Schools and temporary church, in Bosworth Road, Kensal New Town, were opened on Sunday, 8th Sept. The architect is Mr. S. J. Nicholl, and the contractor Mr. A. Stoner.

The new tramways, called the Commercial-road Branch, which run between the East India Docks and the previously existing line at Whitechapel, forming a junction with it at the top of Leman-street, were opened on Monday morning.

The restoration of the first portion—the centre compartment of the west front—of Wells Cathedral being completed, and the second portion—the south-western tower—being nearly finished, a public meeting is to be held on the 9th of October, to consider the advisability of proceeding with the restoration of the north west tower.

A new hotel, to be called the Alexandra, has just been completed at Moss Side, Manchester, from the design of Messrs. Smith & Jewett, by Messrs. Davis & Mawdsley. The cost is about £4,000.

A block of buildings, consisting of six shops with houses attached, has just been erected in Downing-street, Manchester, by Mr. George Napier, builder, from designs by Mr. M. Seanor. The style is termed Conventional Gothic. The front is of stock brick, with stone dressings, and around the edge of the roof is an ornamental parapet composed of small Gothic arches in brick and polished stone. The cost will be about £3,000.

A correspondent says he fears that a like misfortune to that which last week befel Canterbury is in store for Manchester Cathedral, for while on a visit to Manchester recently, he saw men working in the building and carrying naked candles about among the wood-work.

New Schools have been opened at Cosby, Leicestershire. Mr. J. B. Everard was the architect, and Mr. Langton the builder.

The Bristol Gas Company has given notice that from and after the 30th inst., the price of gas will be increased sixpence per 1,000 cubic feet.

Washington is to have a new Opera House. The building is to be erected upon the site of Wall's Opera House, recently destroyed by fire.

The town surveyorship of Winchester is vacant. The salary is £175, and the surveyor will not be permitted to engage in private practice.

A surveyor from the War Office has visited Bedford to find a site for the military establishment which is to be located in the neighbourhood.

A new parish church is about to be built at Jedburgh.

A new Hall for public use is to be erected at Broxburn, Linlithgowshire. It will have a large public reading-room, with a billiard-room attached, &c.

A Memorial to the late Henry Scott Riddell, the poet, is to be erected at Hawick.

A new (Roman) Catholic church and schools were consecrated at S. Peter's, Jersey, on Wednesday week.

A new United Methodist Free Church at Banwell, Somerset, was opened last week. The building has been erected at a cost of about £600, by Mr. John Hands, builder, of Weston-super-Mare, Mr. Hans F. Price being the architect.

The Garrison Lecture Hall, Chatham, which is being erected adjoining and in connection with the Soldiers' Institute at Chatham, is expected to be completed in the course of two months. The style of the new building corresponds with that of the Institute. The builder is Mr. William Hooper, of Rochester, and a portion of the work is being executed by military labour.

The Bishop of Winchester, on the 4th inst., consecrated the new parish church of Bengeworth, near Evesham. The architect was Mr. F. D. Barry, the builder Mr. H. Yates.

A new Wesleyan Chapel was opened at South Shields yesterday. The plan consists of a nave 72ft. long, with aisles 50ft. long. Accommodation is provided for 450 persons. Mr. F. R. N. Haswell is the architect.

A meeting of the creditors of Philip Stamp, painter and decorator, Bristol-street, Birmingham, was held on Wednesday week. Creditors for debts amounting to £724 were present. The statement of the debtor's affairs was as follows:—Owing to unsecured creditors, £857; creditors fully secured, £5,261, the securities being estimated to produce the same amount; creditors for rent, rates, &c., £9 7s.; total liabilities, £866 7s. The assets, consisting of stock-in-trade, &c., were stated to be £46. On the part of the debtor, a composition of 2s. in the pound, payable by two instalments, in three months, was offered, and it was unanimously accepted.

Trade News.

WAGES MOVEMENT.

BARROW-IN-FURNESS.—The bricklayers and labourers, to the number of about 300, in the employ of Messrs. Woodhouse, Son, & Andrews, builders and contractors, Barrow-in-Furness, have struck work, in consequence of the refusal of their employers to concede the Saturday half-holiday.

HACKNEY.—A meeting of chairmakers and carvers in the east of London has been held at Hackney, for the purpose of taking steps to obtain an advance in their rate of wages. They ask for an advance of at least 10 per cent. It was resolved to appoint delegates from each shop to ascertain the views of the masters.

LONDON.—On Thursday week a meeting of delegates from the carpenters and joiners was held to receive reports "as to the way in which the general body of master builders had carried out the terms of the agreement entered into last week between the committee of the associated masters and the deputation from the men, and to adopt such resolutions thereon as might be deemed necessary." It appeared that in the great majority of the firms the terms came into operation on the previous Saturday, and were being satisfactorily carried out, The delegate from Corbet & M'Elmont's, West Brompton, said the firm had been paying 7½d. per hour. They had offered the men 8d. per hour, but the men demanded the 8½d., which had been refused. A shop meeting had been held, at which forty-six out of fifty men had signed their names to a paper pledging themselves to strike if called upon to do so by the delegate meeting. It was eventually determined by a large majority that a special meeting of the delegates should be held on Thursday (yesterday) evening, when the cases of all those shops not working under the new terms would be considered and dealt with upon their merits. The secretary, in reply to questions, stated the number of men now signing the strike-sheets was 152. The balance now in the treasurer's hands was about £40. It was then resolved, "That a levy of 1s. be paid on Saturday; that the signing of the strike-sheets now cease; and that the committee prepare, as early as possible, a final balance sheet up to and including Monday next, the 9th inst., when the last dividend would be paid." On Saturday evening an open-air meeting of the builders' labourers was held in Trafalgar-square, to receive the report of their deputation to the Masters' Association on Wednesday, the 28th ult. The following resolution was carried:—"That, in the opinion of this meeting, the small additions granted to the wages of the builders' labourers is not sufficient to enable them to support themselves and families; and this meeting of labourers pledges itself to use its influence —and hereby calls upon all concerned to assist in the work—to extend throughout London and its district the Builders' Labourers' Union, so that by our united strength we may be able to command our 6d. per hour."

LONDON.—At a meeting of builders' labourers in Trafalgar-square on Saturday evening last, it was resolved to agitate for 6d. per hour, as the present wages are considered insufficient.

LONGTON.—A movement has been made towards a settlement of the dispute between the china saucer makers of Longton, Staffordshire, and their employers, by which dispute 4,000 operatives have been locked out for a month. A mass meeting of operatives was held on Wednesday week, and on the following day a meeting of the manufacturers was held. The former decided to request Mr. George E. Farmer, a town councillor, unconnected with the potting trade, to act as mediator. The masters decided that they would not accept Mr. Farmer's mediation, but would meet the men in conference, as they offered to do before the strike of the saucer makers and the general lock-out of the other operatives.

NEWPORT.—A strike has commenced amongst the carpenters of Newport, Monmouth. At a general meeting of carpenters and joiners, a document, setting forth their demands, was drawn up. In it the men solicit their employers for an advance of ½d. per hour, to make their wages for average skilled workmen 6¼d. per hour, the advance to commence from Monday last. The men say they are compelled to make the demand in consequence of the increased price of "all the necessaries of life." They also contend that their present rate of wages is ½d. per hour lower than the rate paid at Cardiff and Bristol. No reply has been given by the Builders' Association, but it is understood that they refuse to give the advance demanded. The men say they are quite willing to submit the matter to arbitration.

Oxford.—The stonemasons of Oxford having struck last week for an increase of wages, the masters have conceded to their demands of 30s. per week, and the men have resumed work.

Wishaw.—The masters have agreed to give Wishaw nail and rivet makers the advance of from 15 to 20 per cent. recently asked. The advance takes effect from the beginning of this week.

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TENDERS.

Bermondsey.—For additions to S. James's Schools, Bermondsey. Mr. Hesketh, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Lugg	£1420
Tall	1260
Rider & Son	1248
Arnold	1199
Coleman	1169
Tarrant	1120
Kent	1093
Downs & Co. (accepted)	996

Cambridge.—For the erection of Vicarage House, Comberton, Cambridge. Mr. E., Bays, architect, Cambridge:—

Warboys	£1428

Caterham.—For alterations to old schools, Upper Caterham. Mr. Richard Martin, architect:—

Smethurst	£177	0	0
Simons	157	0	0
Scrivener (accepted)	140	0	0
Tooth	110	10	6

Caterham.—For a detached house, Ninehams-road, Caterham, Surrey. Mr. Richard Martin, architect, Caterham, Surrey:—

Hunter (accepted)	£510

Caterham.—For schools and teachers' residences, Upper Caterham, for the Caterham School Board. Mr. Richard Martin, architect, Caterham, Surrey. Quantities supplied by Mr. F. Sparrow, Richmond-road, Barnsbury:

	Roofs slated.	Roofs covered with plain tiles.	Roofs covered with ornamental tiles.	
	£	£	£	s.
Scrivener	2767	add 10	add 21	0
Wright Brothers	2750	deduct 50	,, 30	0
Barnes	2680	,, 32		
Smethurst	2669	,, 45		
Taylor & Son	2661	,, 17	deduct 13	0
Jarrett	2657	,, 70	,, 30	0
Simons	2617	add 20	add 50	0
Thompson	2575	deduct 50	deduct 25	0
Ward (accepted)	2508	—	add 15	5

Chelsea.—For erecting new infirmary. Messrs. John Giles & Gough, architects. Quantities supplied by Mr. C. H. Goode:—

Neave	£19882
Heath	19351
Fish	18985
Stephenson	18459
Elliott	17967
Lathey Brothers	17955
Gough	17000
Sawyer	16885
Manley & Rogers	16797
Rankin	16135
Thorne & Co.	15750
Turrell Brothers	15587

Cubitt Town.—For the erection of a Wesleyan Chapel and school at Cubitt Town. Mr. E. Hoole, architect:—

Hobson	£1350
Harris & Wardrop	1325
Ennor	1248

Croydon.—For alterations to No. 139, High-street, Croydon, for new Post Office. Mr. R. W. Price, architect. Quantities by Mr. W. H. Barber:—

Hipwell	£720
Waller	697
Jarrett	676
Smith	627
Legg	595
Peskett & Taylor (accepted)	589

Fetcham.—For works at Fetcham Park, for Mr. J. B. Hankey. Mr E. I'Anson, architect:—

Holland & Hannen	£20777
Smith & Co.	20630
Rider	20580
Macey	20578
Lucas	20420
Trollope & Sons	18855
Wright Brothers & [illegible]	16975

Linslade.—For the erection of schools and master's house. Mr. J. T. Lawrence, architect. Quantities supplied by Messrs. Paice Brothers:—

[illegible] & Hammerton	£2317
Waterson & Co.	[illegible]
Edwards	1764
Smith & Fincher	1712
Snell	1700
Allen	[illegible]

Liverpool.—For paving Stanfield-road and Tynemouth-street, Liverpool, for the Liverpool Town Council:—

Abram & Richards (accepted)	£255	14

London.—For alterations, additions, repairs, painting, &c., to be done at 21, South-street, Manchester-square, for Mr. Geo. Cornwell. Mr. Chas. Bradley, architect. Quantities supplied:—

Scrivener & White	£784	0
Longmire and Burge	648	0
Ashwell	647	0
Stephens	627	0
Cairns	621	0
Harris & Sons	620	0
Simpson & Son	612	0
Edmund Browne (accepted)	598	10

London.—For buildings in rear of No. 93, Fore-street, City, for Mr. Mein. Mr. James Harrison, architect. Quantities supplied by Mr. A. W. Q. Nicoll:—

Henshaw	£558
Merritt & Ashby	553
Browne & Robinson	516
Ennor	492
Prince (accepted)	485

Manchester.—For the construction of the new offices in Albert-square, Manchester, for the Scottish Widows' Fund:—

Smith & Co.	£9795
Haigh & Co.	7947
Thompson	7871
Southern	7640
Clay & Sons (accepted)	7400

Reading.—The following are the accepted tenders for new schools in Silver-street, Reading, for the Reading School Board:—

Waite (brick and slate work)	£926	0	0
Shepherd (carpenter's work)	392	15	0
Peckover (ironwork)	92	0	0
Sumner (plumber's work)	78	10	0
Total	£1489	5	0

Sale.—For main brick sewers, Sale Sewerage Works (Contracts 12 and 13), for the Sale Local Board. Mr. A. G. McBeath, engineer:—

	Contract 12.	Contract 13.
Hamnett (accepted)	£1360	£1030

Southampton.—For 900 tons of granite, and 300 tons of granite siftings, for the Southampton Town Council:—

Stickland (granite)	£540
Stickland (siftings)	120
Hamley (granite), accepted	495
Hamley (siftings), accepted	97

Southampton.—For the erection of schools at Bevois Town, Southampton, to accommodate 700 children:—

Dunkley & Son (Teddington)	£5290	10	0
Martin & Son	4195	0	0
Dyer	4045	10	0
Gambling	3950	0	0
Crook	3920	0	0
Nichols	3887	0	0
Stevens	3865	0	0
Sanders	3849	0	0
Reynolds & Aldridge (Brighton)	3740	0	0
Bull & Sons	3627	0	0
Laver & Rowland (accepted)	3595	0	0

Southwark.—For rebuilding "The Globe" public-house, York-street, Southwark, for Mr. Turpin. Messrs. Jarvis & Son, architects. Quantities supplied by Mr. T. Perry.

Rider & Son	£3135
Sheppard	3970
Marsland	2900
Hart	2880
Tarrant	2870
Henshaw	2750
Downs & Co.	2726
Eaton & Chapman	2640
Thompson	2623

Surrey.—For works at Kenley. Mr. Richard Martin, architect, Caterham, Surrey:—

	Stables	Pair of semi-detached cottages	Agent's house	Total
Taylor & Son	£301	£300	£454	£1055
Peskett & Taylor	295	288	462	1045
Ward	310	293	425	1028
Thompson	316	245	455	1016
Mason & Bristy	296	280	428	1004
Scrivener	235	284	395	914
Smethurst (accepted)	290	266	348	904

Trowbridge.—For Trowbridge drainage works (Contract No. 1). Messrs. Gotto & Beesley & A. W. Estridge, engineers:—

Chappell	£15000	0	0 (!)
Linzey	13850	0	0
Wickham & Streeter	11950	0	0
Coker	11635	0	0
Neave	11420	0	0
Potter	10700	0	0
Long	10400	0	0
Bugbird (accepted)	10037	11	0
Stevens & Crook	8624	0	0 (!)

Wakefield.—The following are accepted tenders for new Independent School, East Moor, Wakefield (exclusive of fittings and painting). Mr. A. Hamerton, architect:—

Elvey (brick and stone work)	£256	10	9
Rycroft (slating)	21	10	6
Squires (woodwork)	95	10	0
Kirk (plumbing and glazing)	13	0	0
Tattersall (plastering)	19	16	0

London.—For alterations to a warehouse, Hamsell-street, City, E.C. Mr. Herbert Ford, Architect.

Bass	£254
Crabb	245
Simpson	234
Henshaw	191
Young (accepted)	187

London.—For fittings to a warehouse, Hamsell-street, City, E.C. Mr. Herbert Ford, Architect.

Crabb	£599
Bass	540
Young	520
Henshaw	485
Simpson	458

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COMPETITIONS OPEN.

Devizes, October 9.—For designs and estimates for n Odd Fellows' Hall and Institute.—Mr. W. H. Hill, The Green, Devizes.

Grays Thurrock (Essex), September 20.—For plans for schools.—Mr. J. M. Rigge, School-house, Grays, Essex.

Kingston-upon-Hull, September 16.—For designs for two chapels, and an entrance-lodge, to be built in the proposed new cemetery on the Hedon-road. A premium of £20 will be given for the approved design.—Mr. C. S. Todd, Clerk to the Local Board, Town Hall, Hull.

Kingswinford School Board, October 1.—For a design for school buildings to accommodate 800 children, with class-rooms, master's and mistress's houses. Premiums of £10 for the best and £5 for the second best designs.—Mr. J. L. Holberton, Clerk to the Board, High-street, Brierley Hill.

The Royal Northern Agricultural Society (Dwellings for Agricultural Labourers), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Admiralty (Whitehall), Sept. 24.—For Downton's pumps and water-closets.—Mr. F. W. Rowsell, Superintendent of Contracts, Admiralty, Whitehall.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner Land and Works, Victoria, British Columbia.

Castlisland Railway Company, September 28.—For the construction of the proposed line from Gortallea to Castlisland.—Messrs. Cotton & Flemyng, 3, Harcourt-place, Dublin.

Coventry, October 7.—For the erection of Spon-street Schools.—Mr. T. H. Kirby, Clerk to the Board, Coventry.

Darlington, September 25.—For erecting and finishing a fever hospital.—Mr. G. G. Hoskins, architect, Northgate, Darlington.

Featherstone Burial Board, September 28.—For enclosing the new burial ground and erecting chapels, &c.—Mr. W. Gower, Manor House, Featherstone, near Pontefract.

Great Western Railway, September 17.—For the supply of Quebec yellow pine.—Mr. F. G. Saunders, Secretary, Paddington Station.

Great Western Railway, September 17.—For the extension of the engine-sheds at Bordesley.—Mr. F. G. Saunders, Secretary, Paddington Station.

Huddersfield, September 24.—For the ammoniacal liquor made at the Corporation Gas Works.—Mr. J. Burgess, Engineer and Manager, Gas Office, Leeds-road, Huddersfield.

THE BUILDING NEWS.

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LONDON, FRIDAY, SEPTEMBER 20, 1872.

THOUGHTS AT CANTERBURY.

TO the architect, Canterbury presents a mine of wealth which we feel sure has been but superficially explored. Everybody knows Canterbury; not a student who has not seen its Cathedral, and, perhaps, measured some of its details; but have we done enough when, after passing hurriedly through it, we take away photographs, and think we have finished with the old city? Can we say anything new about this metropolis of the Church now that all eyes are turned to its Cathedral, which has had so narrow an escape from destruction? Feeling that it will be a task at once pleasurable and profitable, we will consider in a brief way the secrets that underlie the beauties of Canterbury. From the Cathedral itself down to the poorest cottage there is contained a very gamut of architecture—an artistic harp of full compass. Nor are the most valuable lessons to be taken from the loudest notes or the loftiest monuments. We may, perhaps, say that the charm of Canterbury lies in its "play of roof"—all that can be done with roofing seems accomplished here; there is not a monotonous street in the city. How comes it that such variety and change melt into harmony? Upon what system did the builders work? Certainly, it is a curious question, and one we will leave to more philosophic minds to answer. We must deal with the question in a matter-of-fact way, and ask ourselves if we cannot emulate those builders and bring modern skill to bear upon their building "instinct"—such alone can we call it. Mr. Ruskin was one of the first to call attention to the value of the roof, and his opinions are not to be lightly esteemed; at any cost we must have the roof, even to our loftiest houses—an agreeable sky outline we are bound to get somehow. Colour and cleanliness are two of the ingredients which materially help the architecture of Canterbury. One feels ashamed of London whilst breathing the air of this famous old town. Why can't we clean London up and transplant a bit of Canterbury into it? Are we to live in dirt for ever? Now that coals promise to be so scarce, can't we make it an excuse to consume our own smoke and dirt? What an attractive problem for the ingenious mind!

At every turning in this delightful city there is an architectural composition—the smallest and most obscure streets contain very prodigies of daring construction. How the houses stand up puzzles us, yet there they are, fascinating and bewildering; favoured by fortune, they seem to have tumbled into beauty, and that in an easy, inexpensive way, without an effort. Nor does it seem that sound rules are violated. What kind of a Building Act they had in those simple days we know not. No wonder that artists linger about the streets with pleasure. Architects, practical men, must look at these buildings, and take simple lessons, to apply, if possible, in a better way. What charm there is in the sailing of the upper stories—depth of shadow, change of frontage, and harmony of varied gable. Back yards, laundry and scullery dormers, all seem alike to have partaken of the pride of the builder—sunshine and colour lighten them up into almost fictitious value. Each separate house has its individual expression, and seems nodding its head from the sheer pleasure of having been built at all. The contemplation of Canterbury tempts us to inquire into the secret source of its power; contentment and peace seem to dwell upon it, so far, at least, as either of those blessings can be distinguished by a casual observer. Surely it is not mere rhapsody to consider it in this light.

Art cannot be forced: it is a plant of slow growth, and needs congenial soil in which to take root; it is the outcome of a people happy in their aims, and of generous and humane impulses. Where the best virtues of humanity are in the ascendancy true art will fall upon a nation like dew from heaven. No price can be named for it but the price of single-hearted and unaffected love; steam will not bring it to us, speed cannot reach it, wealth will not tempt the smiles of the capricious maiden. We weep for London, and are amazed at its desolation, but we fancy that even yet there is sufficient leaven remaining to raise the vitality latent within it. When shall we learn that to a nation rich and powerful as ourselves true art is as vital as the air we breathe—that a potent remedy for many social evils lies in interesting the people in a purifying art and teaching them to look upon even the humblest architectural effort as something meant for them to understand and enjoy; not to avoid as if it were something beyond them, and of which they were expected to know nothing?

It is the business of the architect to furnish the public with delight; cost does not rule the quantity of real pleasure a building should contain; sins of excess are more fatal than those of omission, and are by far the most prevalent amongst us. As in a painting, it is not the quantity, but the relative position of its colours, that determines its power, so it is in a building, which is, after all, but a picture in stone or brick, capable of conveying the same message, speaking to the people in even a loftier language that cannot be hushed or silenced. If ever in our history architecture needed strong and earnest leaders it does so at the present time. We want archæology to be the servant, and not the master, of our thinkers, for no mere revival of any style can satisfy us now. Let us look diligently for the principles which must always govern art, and apply them in our own time with the best available materials and skill. We ask ourselves why London, which is the centre of intellect, and should be the throne of art, is left carelessly in the hands of men, powerful it may be, but avowedly ignorant of the rudiments of art? There can be no art without artists; no architecture without them.

The nation that possesses the arts of peace has the ear of the world. Can we say that we hold that position as regards architecture? Now, as we enjoy this peaceful city, and compare it with the still fresh impressions of London, can we draw a moral from the comparison? Is size a fatal element to the art growth of London? Can a town be big and beautiful? These are questions worth considering. Here in Canterbury we get in perfection what three millions of people fail to secure! the only preventitive being an apathy and indifference in art matters most humiliating to think of. The obstacles to progress in art are very formidable, and lie deep in the hearts of men. Few can see the connection there is, and must be, between a people, their manners, and the art they produce. Art is the embodiment in a tangible form of the mind of an individual or nation, else it were of no value whatever. If architecture can give us nothing more than a medley of borrowed detail and ornament arranged to suit customers, it has, indeed, lost its claim to be considered a fine art, and would merit the indifference which it at present receives. But it is not so; to our mind architecture is the one art that cries aloud from the house-top, and should marshal under its banner the genius and sinew of the age; it should be supported and fed, not from the weakly offspring of would-be ambitious parents, who choose a genteel and "easy" profession for their progeny, but strong and gifted men must be called to the giant task of rekindling a national architecture. No general in the field, or senator in the House, requires higher or more varied powers than the architect; a natural gift must be fostered by a costly education, and a delicacy and refinement of thought must be carried by a muscular frame, and yet these diverse requirements are left to be cultivated upon the haphazard principle of natural selection! Men of blood stand aloof, and affect to despise what they were never taught to understand. Truly has the Slade Professor at Oxford said that art needs for its votaries the best aristocracy of the land; how much more strongly do these remarks apply to architecture. It is high time that the people demanded the best and most cultivated intelligences for its development; an occasional genius can do nothing, unless encouraged by a sincere and heartfelt demand on the part of the public; the people must cry aloud for better fare, and must feel their need of it: they will not cry in vain.

We are led into these thoughts at Canterbury, a very shrine of English art—every roof tile has something to tell us, and the very air is laden with warning. Would that we could infuse some of its spirit into the languid veins of London. We are proud of our metropolis, but shame struggles with the feeling as we compare these cleanly, God-favoured precincts with the dreary masses of dispiriting building that burden our modern Babylon. This need not be so; signs of better things are in the air, but they will not grow unaided. We hope to consider the question more practically and in detail when we return; we must content ourselves, until sketches can be given, with simply recording a few thoughts at Canterbury.

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LAND SPANS AND ARCHES.

THE majority of bridges erected over rivers and streams have one or more land spans. By the term "land span," or "land arch," is meant the span or spans nearest to the abutments, under which no water flows, or flows only at certain times. This is the broadest definition of the term, and some discrimination must be used in its application. Let us, for instance, take the case of a bridge of five or six arches or spans, erected over a wide river in a mountainous district. At certain seasons of the year all the spans, with, perhaps, the exception of the centre one, will be dry, and passable for both vehicles and pedestrians. But during the autumn and winter the floods from the upper levels will be so violent as to form a deep and rapid current, extending from one abutment to the other. Although the majority of the spans are, therefore, dry at certain times of the year, they can scarcely be called land spans. But there is another case which bears out more correctly the signification of the word. It is that of a tidal river, which is not dependent upon periodical floods or heavy storms for the varying level of its waters, the height of which is regulated by the rise and fall of the tide. Again, there is a third case, which may be considered as the true exposition of the technical phrase. This occurs when the arch or span nearest the abutment is built designedly for the purpose of affording a passage underneath for ordinary traffic. A common example is to be seen in the bridges over large canals and navigable rivers, upon which barges are in the habit of plying. To allow a passage for the towing path, a small arch is generally turned at one or both sides, which is in the strictest sense a land arch. Independently of all these considerations, a land arch is frequently attached to a super-aqueous bridge for no other reason than to avoid placing the abutment too near the water. When the foundations are bad, or of a treacherous unreliable character, it is preferable to found the abutments some short distance inland, which consequently leaves the span intervening between them and the first piers on either side nearly dry. There is still one more case to be noticed, which embraces all those examples in which originally the water way extended from one abutment to the other but from alterations in the course of the river, either naturally or artificially, one or other of the extreme spans have become dry. This last consideration brings us to the more immediate subject of our article.

It is said that the present Thames Embankment, upon the Middlesex side of the river, was projected and discussed fully thirty years ago, but that owing to that procrastination which ever attends the carrying out of public works, it was shelved and put off from time to time, until its execution devolved upon the men of our own day. From the manner in which some of the modern bridges over the Thames have been built it is evident that but very little attention was bestowed upon the probability of the Embankment being constructed. Waterloo Bridge, being anterior to even the proposition of the embankment, may be omitted in the category, but the manner in which the wall joins in with Blackfriars Bridge is certainly neither pleasing to the eye nor in accordance with the general run of the river. Standing on the bridge, at a point nearly vertically over the first pier from the Middlesex end, and ranging the line of the Embankment wall, its direction, if prolonged, would nearly catch the pier, and by a gentle curve could have been brought into it, thus converting the arch springing from the northern abutment into a land arch. As it is, the wall is brought by a curve in the reverse direction to meet the abutment, and forms a re-entering angle, terminating in a complete *cul-de-sac*, where deposits will rapidly accumulate. A glance is sufficient to demonstrate to the merest amateur that the line of the wall should have been kept back or the northern abutment of the bridge pushed forward. The true mean would have been obtained by making a slight alteration in the present position and direction of both. It may be urged that in taking this view of the matter we have only had regard to the up-stream side of the river, and that the position of the abutment of the bridge of the London, Chatham, and Dover Railway, in some measure regulated that of the Blackfriars Bridge and the Embankment wall. That there is some justice and force in this remark we do not pretend to deny, but the plea is not sufficient to excuse the sharp fork that is formed between the northern abutment of the bridge in question and the wall.

Returning to the conversion of wet spans into dry ones, the railway bridge at Charing-cross furnishes an excellent instance in point. There are now three dry, or land, arches on the Middlesex shore. One of them certainly cannot be called a *dry* span, as will be presently explained. Under one of these spans the main road of the Embankment passes. The next is appropriated by a portion of the roof of the Metropolitan Railway Station, and constitutes one of the most hideous sights along the whole riparian route from Westminster to Blackfriars; and the third and last is carried over the back road connecting the main thoroughfare and that leading from Whitehall with Villiers-street, the upper end of which opens into the Strand. While alluding to this street, it may be mentioned, *apropos* to the matter, that unless a sufficient number of thoroughfares connecting the Strand and Fleet-street with the Embankment are opened up, the greater part of the value the latter work is supposed to confer upon the public will be lost. The continuation of Villiers-street should have been laid out to the left, looking towards the river, and not taken round under the Charing-cross Bridge, thus obliging a vehicle coming from that part of the Strand to the river to pass twice under the same bridge and circumnavigate the Underground Railway Station. The leakage of railway bridges erected over metropolitan streets is notorious, and the companies have been compelled to take means for preventing it. The usual method is to sheet with zinc those portions of the soffit which are over the footpaths, or to put up a kind of zinc cover or screen, while proper gutters and downpipes are supplied for carrying off the water as it accumulates. Something of this sort ought to be done with the soffit of the land or fan-shaped span of the Charing-cross railway bridge, as its present state is simply disgraceful. It not only leaks, but there is a regular down-pour of water at various points upon the pathways and road beneath. It would appear as if the methods for accomplishing the drainage of the superstructure, when there was water underneath the span instead of a road, has been left unaltered. As yet, it is true that there is no thoroughfare from the Strand to the Embankment *viâ* Villiers-street, but that is no excuse for allowing the state of affairs to continue. The way is open to pedestrians; they ought not to be compelled to put up their umbrellas in passing under a bridge. Neither can the plea of expense to the company be accepted as exonerating them from their responsibility, for it was perfectly well known at the time the bridge was built that before long the river would be diverted from some of the spans, and that they would ultimately be over roads and metropolitan thoroughfares; but with the actual party upon whom it may devolve, legally or equitably, to make the road passable, we have nothing to do. In the interest of the public, whenever new routes and streets are carried under bridges which may formerly have spanned a waterway, it is somebody's duty to see that the soffits are watertight, and that the drainage is discharged into the proper receptacles for it, and not upon the persons of the unfortunate wayfarers below.

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NOTES ON EARTHWORK—XVII.

(*Concluded.*)

HOW much of the reclaimable land, lying between high and low water mark on any shore, it may be judicious to enclose in each separate case must depend, first of all, upon whether the land after enclosure is to be drained by the natural gravitation of the water outwards through sluices in the bank when the tide is down, or whether it is intended to be pumped out by machinery. We will consider only the first case, which is the ordinary one.

Wherever the line may be chosen for the construction of the bank in respect of the profitable nature of the soil to be enclosed, that is more an agricultural than an engineering question, and does not now concern us. It must be assumed that before the engineer receives his instructions, and, therefore, before any earthwork is commenced, this limit has been chosen in consultation with the agriculturist.

The next thing to be kept in view is that the land to be enclosed must be drained, and for this purpose a delph, or main drain, is cut along the inside of the bank at a distance from the foot of its inner slope which depends on two considerations—in the one case whether a sufficient width for a roadway is to be left, which is usually a convenient arrangement, and in the other whether the ground is of such a nature as to stand without the least chance of a slip in consequence of the excavation being brought near to the foot of the embankment. The least dimensions usually given to these drains are 10ft. wide at top, 5ft. wide at bottom, and 5ft. deep. This depth allows a depth of water, sufficient to act as a fence to cattle, of 3ft. 6in., while the surface of water stands at a level 18in. below the lowest part of the land. This depth is considered to be the least that affords effectual drainage of the land. Where the surface of the land enclosed is higher the depth of the drain is made so much deeper. The water level of the drains having been thus determined relatively to the land level, the sill of the sluice through which the inland waters escape into the sea or river is laid as much below it as will give a sufficient depth of water upon it to enable the sluice, according to its other dimensions, to carry off the greatest quantity to be discharged. The absolute water level of the drains is to be fixed with reference to that of low water. The higher it is above low water the longer will be the time during which the inland waters can run out at each tide, and, therefore, the better will be the drainage of the land; for as long as the sluice doors are shut by the tidal water, the inland water must accumulate in the drains. But on the other hand, to secure a long time of outflow at each tide, the sill of the sluice must be placed high above low water, and, therefore, the area of land to be enclosed must be so far contracted; and if the area of the enclosed land be extended to the utmost the sill would be placed at or near the level of low water, but in this case the time of outflow would be the shortest. The proper level of the sill of the sluice is therefore between these two extremes. A tide flows from low water mark to high water mark, and ebbs back again to low water mark, in about 12 hours and 20 minutes. The time occupied by the flow and the time occupied by the ebb is not always equal, being influenced by heavy currents of fresh water in rivers, and by the prevailing winds in other places, but, generally, we may take the time of each at 6 hours. The tide fluctuates in its range—that is, the height to which it rises above, and the depth to which it falls below, the mean sea level, or half-tide level—from neaps to springs, and back again to neaps, twice in a month. On the occurrence of full moon, and again at new moon, the tide rises to its highest ordinary level, which is called high water spring tide, and falls to its lowest level, which is called low water spring tide. Midway in point of time between every couple of spring tides the tide rises to a less height above, and falls to a less depth below, the mean tide level, which is constant in point of level all round the coast, or nearly so. These latter are the neap tides. The act of rising is called the flow of the tide, and of falling, the ebb. In about 1½ hour after the time of high water the tide falls to quarter ebb; in 3 hours, half ebb; in 4½ hours, three-quarters ebb; and in 6 hours low water; in 7½ hours, quarter flood; in 9 hours, half flood; in 10½ hours, three-quarters flood; and in 12 hours, high water: the time being reckoned by the lunar hour.

If the level of the water in the drains, then, be fixed at the mean tide level, the water outside the bank will be below it for 6 hours each tide, and above it for 6 hours. By means of a self-acting door or sluice, which opens outwards and shuts inwards against a fixed frame, the inland water flows out during a time proportionate to its height above low water; and during the remainder of the time of each tide the valve or door of the sluice is shut by the tidal water rising above it. For this length of time, therefore, the drains act as reservoirs, receiving the land water and storing it until the next period of outflow. For this reason they require to be of considerable size, in order to prevent the water in them rising to a height which would be insufficient for the proper drainage of the land. It is for this reason that they are made of so considerable a size as that we have mentioned, in addition to the other reason of a cattle fence. Indeed, on large areas, the dimensions are greater than those mentioned, and the perfection of the drainage is further assured by intersecting the land with other drains of similar dimensions, dividing the area into "marshes." To prevent more water coming into the enclosure than is due to the rainfall upon it, a catch-water drain should be cut round its upper margin to take away to a separate outfall the water that flows from the uplands; for otherwise the upland waters would often flood the enclosure.

In addition to these main drains, grips are cut to bring the land water into them.

It is stated by Mr. John Wiggins, in a treatise on the practice of embanking lands from the sea, that in Essex, where he had, for a long time, charge of works of this kind, it is not the custom to enclose the ooze or mud overflowed by every tide, but only the "saltings," which are only covered by spring tides. The banks, or, as they are there called, the sea-walls, are therefore on ground generally 5ft. or 6ft. above low water level, and seldom exceed 6ft. or 8ft. in height above the ground. Here the soil is particularly favourable, both to sustain the embankment and as a material for making them, and is called marsh-clay. In the Isle of Ely and in Lincolnshire the soil is silt. There, also, few embankments are placed on ground less than 5ft. above low water. The best and earliest indication when a marine soil has become fit to embank is the growth of samphire, which demonstrates its stability and permanence of position, and is the forerunner of the marine grasses. The best soil for an intake (as the enclosures are called in Essex) is that clayey earth whereon marine herbage grows, and which lies above the level of ordinary tides. The next best is silty earth; the third is mud banks with samphire, over which the spring tides always flow; the fourth is mud, over which the tide always flows more or less; the fifth is sheer sand, which is almost barren, except as to a few plants of the rush kind. It happens generally that the higher the lands to be embanked the more they are intersected by rills and creeks, and this is a common drawback on the eligibility of this land for the construction of a bank. The lower levels of the shore, or slobs, are, on the contrary, almost free from this objection, and when in other respects eligible these lower levels present tempting subjects of embankment. The best level at which to place a sluice, Mr. Wiggins says, in order to afford the longest run of water, is probably between the mid tide level and the low water level of neaps, because, although the run from mid ebb to mid flow is near the maximum of six hours time of running, yet, in case of there being any water in the intake above that level, its weight will push its way for some minutes, perhaps an hour, before mid ebb, and for some time after mid flow, making the run seven hours. If placed lower the valve or door of the sluice would be shut sooner by return of tide, and if placed higher the water would run out longer, but a less quantity per hour would run. The sills of some sluices have been laid down not more than from 6in. to 12in. above low water level, according as the tide ebbs out more or less at springs or neaps, when not kept up by winds. These sluices, with a good ebb, and having 12in. of water on their sills, will run four hours. He concludes that as the waters of an intake should never stand less than 18in. below the lowest level of the land (except where lakes must remain), and as 6in. should be allowed for the depth of water on the sill, that sill should not be placed at less than 2ft. below the level of the land on which the bank is raised; and, further, as there ought to be at least 2ft. fall from the sill to the level of low water spring tides, it follows that the ground on which the bank is placed should be at least 4ft. above low water mark.

On the east coast of England there is a constant contention with the encroachments of the sea, and the waste of land is very considerable on some parts of the coast. But, as a compensation for this waste, land is reclaimed elsewhere by a process of warping, whereby the surface of low lands is raised by tidal deposit of rich fertilising matter. Mr. Oldham, to whose paper, read at the Institution of Civil Engineers, we have already referred, says that on the banks of the river Humber, and on the sea coast of Holderness, the waste is very great. On the Lincolnshire coast of the Humber, from South Ferriby westwards, the loss is also great. Within his recollection, in a length of from 3 to 4 miles, not less than 200 acres of rich valuable land have disappeared. The ravages in this locality threaten to outflank, in a few years, the sluices and lock constructed under the direction of Sir John Rennie by the late Mr. Adam Smith, for the Commissioners of the Ancholme Navigation, at South Ferriby (and which were visited by the present writer, when a pupil, during their construction).

The loss of land on the seaboard of Holderness is very great. Mr. Oldham says that by observations made over a considerable period of time along 40 miles of coast, the average width of land washed away is about 2¼ yards per annum; and such is the sure and onward progress of the advancing sea that within a comparatively short interval whole villages have disappeared. Although it has been ascertained that the average loss on the whole coast of Holderness is 2¼ yards per annum, yet the progress is not uniform along the coast, for in some districts little or no change is perceptible, while in others 10 yards or 15 yards disappear in 12 months, and where a check is not given to the encroachment nearly double that quantity is lost in a couple of years.

What becomes of this *debris?* In Phillips's "Geology of the Yorkshire Coast" it is said that "The materials which fall from the wasting cliffs between Bridlington and Kilnsea are sorted by the tide, according to their weight and magnitude; the pebbles are strewed upon the shore beneath the precipice from which they fell; the sand is driven along and accumulated in little bays and recesses; whilst the lighter particles of clay are transported away to the south, making muddy water, and finally enter the great estuary of the Humber, and enrich the level lands under the denomination of Warp." At the mouth of the Humber, on the north or Yorkshire coast, there is a level tract of rich alluvial land 10,000 acres in extent, called Sunk Island, the greater part of which has accumulated during the last eighty years or so. Mr. Oldham was of opinion that the whole of the deposit forming this island and the neighbouring accumulations has come from the sea face of the coast of Holderness, and his conclusions are based on the following considerations:—"The deposit can only take place when the water is in a quiescent state, and the time when this occurs is at high and low water. Now, as the accretions cannot be produced at low water, except in some instances to a small extent, it must follow that they can only be found at high water. Taking, therefore, the time of high water as that when the mud held in suspension by the tide is deposited, the question follows, from what direction has the tide last come at high water? The deposit could not have come *down* the Humber, seeing that the current has been running up for five hours, the time the tide occupies in rising; and, therefore, whatever might be floating in the water at flood tide would be conveyed up the estuary. Hence the matter forming the accretions in question must have come in with the tide, and have been deposited at high water." The soil at the surface, and to a depth of 5ft. or 6ft., is found to be of an exceedingly fine alluvial description. Below this, sand and drift gravel are found, to the depth of about 30ft.; then 8ft. or 10ft. of strong clay; below which there is a depth of from 14ft. to 16ft. of silt, or sand and clay of a loose description. Mr. J. D. Sollitt, of Hull, described the nature and constituent properties of the Humber deposits, in a paper presented to the British Association in 1853, as being chiefly an exceedingly find sand, the particles of which are so minute as almost to float in water, and being of such a quality as to render the whole quite unstable and liable to be moved about by the slightest motion of the water. The sand forms about 75 per cent. of the deposit. In a gallon of water taken from the Humber when the water was agitated by the tide there were from 315 to 320 grains of this fine deposit, which, after standing for 10 hours, had not all settled. The accretions at Sunk Island rise until the average surface level is coincident with the average surface rise of all tides, and when this elevation has been attained the vegetable action commences, and marine plants appear. The first vegetable life on the soft mud surface is the marine plant samphire. This is followed by wiry rush-like grasses, of the sedge genus, and several kinds of plants having strong deep-shooting roots, and flat wide-spreading heads, which rest on the surface of the ground. When the surface of the salt water accretion has become covered with vegetable life, and the ground is well consolidated, it is considered to be in a suitable state to be embanked.

On the banks of the Trent, the Ouse, and the Don, there are large tracts which were formerly swamp and peat bog land, and many thousands of acres have been, by the process of warping, converted into rich agricultural districts. The usual mode of warping is to construct a sluice on the bank of a tidal river, and, in connection with it, a drain or channel for the flow of the tide into and over the land to be warped. During spring tides the water is admitted up to the full flow of high water; the inner door of the sluice is then shut down, so that the water is retained until the river has fallen. The mud held in suspension is thus precipitated, and the water, which entered heavily charged with alluvial matter, becomes clear. The door of the sluice is then raised, and the water allowed quietly to escape, leaving behind its load of rich deposit. Mr. Oldham has known a district of low and comparatively worthless land receive in the course of 2½ years an average depth of deposit of 3ft., and thus to be rendered available for crops of grain within three years of the commencement of the operation. The outlay varies from £5 to £20 per acre, according to the nearness or remoteness of the land to or from the river, and other circumstances.

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LEICESTERSHIRE AND NORTHAMPTONSHIRE ARCHÆOLOGICAL SOCIETIES.

THE joint annual meeting of the members of these societies commenced on Tuesday week, at Lutterworth, with divine service in the parish church. Subsequently, the Rev. G. A. Poole explained the principal features of this edifice.

The earliest portion of Lutterworth Church is the lancet window in the chancel, which was of the thirteenth century in date. What the church was like at that time they had no means of knowing. It probably consisted of a nave, aisles, and a tower. After the thirteenth century they had to go a long way into the fourteenth century before they could find any remains of what was done, but there were indications that in the middle of that century a great deal was done in that church, for the tower, the nave, the clerestory, and both aisles belonged to the fourteenth century. Wycliffe was inducted into the living at Lutterworth about the year 1375, and the tower was probably in the same state as now, with the exception of the upper portion, which was wanting. The nave and aisles and chancel were, however, then converted from the Early English to the Decorated style of the fourteenth century. It was probably in the fifteenth century that the present clerestory was built. It had always been a moot question with antiquaries as to the date of the old wooden pulpit. Mr. Bloxam, of Lutterworth, doubted whether it was the actual pulpit in which Wycliffe preached, and had rather lost the good graces of the Lutterworth people for his assertion, but in his, Mr. Poole's opinion, there was evidence that the pulpit was contemporaneous with Wycliffe. The character of the carving indicated that it belonged to the transitional period when the Decorated was changed into the Perpendicular, and Wycliffe lived about that time. After a cursory allusion to the monuments erected to Wycliffe and to the memory of the founders of the church, Mr. Poole called attention to the south window in the chancel, which he said was worthy of attention. In reply to a question, Mr. Poole said it was difficult to say whether the north and south aisles were both of the same date, but probably they were. At half-past two the company returned to the Museum, where an address was delivered by the Rev. W. F. Wilkinson. The Rev. Assheton Pownall then read a paper on Mediæval glass vials found at Lutterworth and South Kilworth. Mr. Pownall said the glass vial at South Kilworth was found in the autumn of 1868, while the church was being restored. It was discovered among the foundations of the east wall of the chancel. The vial was about 5½in. in height. It was lying bottom upwards among the stones and earthy rubbish of the foundation not less than from three to four feet below the existing surface. In shape the glass tapers gradually as a horn does, but as the mouth of it is broken, it cannot be affirmed that it held a stopper. Its contents are also unknown, for all that was to be made out was a film of some substance lining the bottom, which has never been analysed, and which only presented to the eye the appearance of the dry sediment of some fluid. This glass vessel was exhibited at a meeting of the Society of Antiquaries, and a description of it has appeared in the Society's Proceedings (2nd series, Vol. IV., p. 284). Various conjectures were offered at the time as to the probable use of the vessel and of the causes which may have led to its being deposited in the foundations of a fourteenth century chancel, but no decision was then arrived at. That glass vessels were in use in that period for church purposes was well known, but no antiquary had been able to lay his hand on any particular piece and say this is glass of the thirteenth, fourteenth, or fifteenth century. The finding of a similar vial in the foundations of Lutterworth Church in 1867-69 had confirmed previous conjectures as to the use of these vials. The one found at Lutterworth is quite perfect. In Mr. Pownall's opinion, the two vials evidently belong to the same period and the same manu facture. The vial from Lutterworth, when found, contained some oil of origanum, which smelt as strongly as the same kind of oil in the chemist's shop. The Lutterworth bottle was found in the foundation of the west wall of the north aisle of the chancel. The foundation was composed of stone and earth instead of mortar, and the bottle was nearly at the outside. A similar vial has been found in Cornwall filled with blood, and it is Mr. Pownall's opinion that the last mentioned was a relic, the blood of the patron saint to whom the church had been dedicated. He did not believe, as had been conjectured, that these vials contained one of the sacred oils of the church in pre-Reformation days. With the assistance of Mr. Bloxam, of Rugby, he had, after consulting various authorities on this subject, come to the conclusion that these two vials were used to deposit relics of the Saints—that is, they were once receptacles of objects consecrated in the religious thought of the day by association with one of the Saints. Having given proofs of the use of glass vials, of the special purpose to which they were put, and narrated particulars of the Saints, whose remains were imagined to give out a sacred oil, Mr. Pownall said it would be noted that among the Saints mentioned by him had occurred those of S. Mary and S. Nicholas. When, therefore, he was able to add that the dedication of the church at South Kilworth was to one of these two, and that of Lutterworth Church to the other, a link worth welding had been attached to their chain of evidence. In the days when many things, holy in the estimation of pious souls, were being shamefully desecrated, under the influence of a desire to save from similar desecration a long prized relic of the parish church, he could conceive men to have acted who placed these vials some feet below the ground. The stowing away of one led, probably, to a like concealment of the other, for the two churches are not wide apart, where they laid hid; and being stowed away there, it was hoped they would lie safe under the soil until protesting zeal relaxed and ancient sympathies revived.

A number of the members then paid a visit to Misterton Church, about a mile and a half from Lutterworth. This church, which is in a restored condition, possesses a very fine broached tower. Its principal features were explained by Mr. Sutton.

At half-past five, on the return of the company to Lutterworth, the members of the Association and their friends dined together at the Hind Hotel.

The evening meeting took place at 7.30, at the Town Hall, Captain Pearson in the chair. A paper was read by Mr. Thompson, of Leicester: "The History of Lutterworth as a Market Town." The next reader was the Rev. Ernest Tower, who read "The History and Antiquities of Elmsthorpe, in the county of Leicester, down to the present time, 1783, by Richard Fowke, of Elmsthorpe."

Mr. Sharpe, of Northampton, then said a few words respecting the flint implements and the remains of extinct animals.

The excursion took place on Wednesday, when about fifty ladies and gentlemen started at nine o'clock from Lutterworth, in three large carriages. The first halting place was Newnham Paddox, the seat of the Earl of Denbigh, which was thrown open on the occasion, and where the visitors inspected a large collection of family portraits and other pictures by Vandyke, Rembrandt, and other masters. A short drive of about a mile brought the visitors to Monk's Kirby Church. The Rev. G. A. Poole proceeded to describe it. He observed that the finest feature of the church was the tower. Probably a great deal of the grandeur of the tower was owing to the kind of stone of which it was built, the Warwickshire red sandstone, which was very friable, and compelled the use of large buttresses, and the absence of delicate details. Unfortunately the upper part of the tower had been treated like others in the neighbourhood. Somebody, about 200 years ago, thinking Renaissance was better than Gothic, put some curious pinnacles on the top. At the east end were sedilia and piscina, which were Geometrical, about the latter part of the thirteenth century, or early in the fourteenth. When the church was built there were monastic buildings of some kind adjoining on the north side, which trenched a good deal on the proportions of the church. The tower was very oddly adapted to the church, or rather the church was very oddly adapted to the tower. The pillars were of a very peculiar section, elongated from north to south, and not east to west. Another peculiarity was that they had no capitals, which was a poor method of dealing with thé thing, but not unpleasant sometimes. Some of the windows must have struck them as specially ugly; so ugly that they must have been original, for he could not imagine any architect copying them. There were some Perpendicular insertions in the north aisle. In the north wall of the chancel was an opening which was very peculiar: looking upward there appeared to be a sort of chimney, and he believed it was probably an Easter sepulchre. There might be some scenic representation of the Resurrection, and figures introduced, and a light might be thrown on them either from above or below. The church had been restored at a cost of £8,000. In a chapel on the north side were two fine monuments of the Denbigh family, in good preservation, one of the dates 1547 and 1539, and the other of 1580. A large painted window at the west end was one of Hardman's best works, and a very fine specimen of modern work. The next stage was Brinklow; and the first object calling for attention here was a lofty tumulus, an artificial mound or hill, adjoining a quadrangular earthwork. The party being gathered on the top, Mr. James Thompson stated that "low" all over England in the names of places meant a burial barrow or mound, and that that was the original purpose of the place on which they were standing. Being readily adapted for warlike purposes, subsequently there might be a tower or keep erected on it. The probability was that it was a burial mound in Saxon or even Roman times, and in the Norman period the site suggested itself as a good one for the purpose of maintaining an armed body, and other works were added. The site very much reminded him of a similar one at Hallaton, in Leicestershire. An excavation of it would probably produce some interesting relics. The party next proceeded to the church, and the Rev. G. A. Poole remarked that there was not much to say about it. The first feature, which they could not help seeing and feeling, was that the church not only stood on a hill, but was built up-hill, and the architect had missed a fine opportunity of making a grand rise from the west to the east by steps, which would have been much more comfortable. There was a good staircase to the rood screen, and another feature was the repetition of what they had seen at Monk's Kirby, the arches being without capitals to the piers. Another peculiar feature was that there was a very good wooden north porch, with some nice carving, no doubt arising from the town standing on that side. The west window was the finest of Hardman's he had seen. There were some small specimens of good old glass in the windows. The next stage was Coombe Abbey, a seat of Lord Craven, situated in an extensive and finely-wooded park, formerly the site of a religious house of the Cistercian Order, founded in the reign of Stephen. Here the visitors had the privilege of seeing an extensive collection of ancient armour and weapons and numerous pictures. Mr. Poole stated that part of the cloisters were some of the oldest work they had seen that day. The entrance to the chapter-house was in the Transitional style of architecture, the change from Norman to Gothic, which commenced about 1145, and in 1150 or thereabouts that house was supposed to have been founded. After luncheon the party spent some time in visiting the pleasant gardens of the place, and then proceeded to Withybrook Church. Here Mr. Poole remarked that he supposed they would think he had brought them to an insignificant church, but ecclesiologists were pleased to find an insignificant church, one not overdone in the way of restoration, and there were two or three things worthy of notice. In a doorway on the north side they would find the base of an Early English pillar, of the thirteenth century, built up in the wall—except the cloisters at Coombe Abbey the oldest thing they had seen yet. Another thing was, that rude as the church was as a whole, there was some good carving of the heads at the ends of the arches, and there was a very nice little Decorated clerestory. A special feature was that on the south side of the chancel they had clearly an Easter sepulchre, which could be approached behind so that things could be introduced into it, and made part of a scenic representation. The next and last stage brought the visitors to Claybrook Church, a very fine building, with a chancel of unusual length. Mr. Poole remarked they could all see what a beautiful Decorated chancel that was, of the style of abont 1340 or 1350. The windows were perfectly beautiful. The east window, which had replaced a sort of square thing that was there in 1820, was filled with tracery, which did not quite harmonise with the other windows, and would have been better if the style had been later. There was some good painted glass in several windows. Outside, they could see there what was a leper's window, or lychnoscope. Thanks being voted to Mr. Poole for his kindness in describing the churches, the party proceeded to Ullesthorpe and Lutterworth, and broke up.

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SIR GILBERT SCOTT ON ART SCHOOLS.

SIR GILBERT SCOTT, R.A., presided on Friday last at the first annual meeting of the Selby Art Classes. He said that as he had been requested to preside at the meeting and make an opening address on the subject of art schools, he would endeavour to offer a few remarks which struck him as being pertinent on that subject. The first question, he thought, which they all ought to ask themselves was—What is the purpose for which art schools are founded? He would reply to that by saying that it was to educate young persons in the use of their natural perceptions as to what was beautiful in the objects by which they were surrounded; then it was to educate them in the exercise of their eyes in understanding and appreciating those forms; then it was to educate them in the use of their hands in copying and reproducing those forms; and, lastly, when they had become proficient in copying those beauties it was to enable them to produce beauties of the same kind for themselves. It might be asked by some whether such education was indeed necessary; and it might be urged that in less civilised times than the present the necessity for such education was greater than at present, and that the education of our eyes and fingers was superfluous. It was clear, however, that science and mechanism were palpably distinct from art; and the education that was imparted in art classes could not be otherwise than useful and beneficial. He then reviewed the various stages through which his own art, architecture, had passed at different periods; and also the superiority of the productions of the middle ages in jewellery, tapestry, and mosaics, to anything that had been produced in the nineteenth century. Those ages were dull ages, no doubt; and art at that period had been at a very low ebb. He then referred to the time at the latter end of the twelfth century when the choir of Canterbury Cathedral was destroyed by fire. Two architects, one a Frenchman and the other an Englishman, had been employed to rebuild it: and the result had been a perfect revolution in architecture, for they had carried out their work in a style of magnificence which even at this day excited our wonder. So strong was the feeling of admiration that was aroused that the most beautiful edifices began to arise all over the country; and among the many instances that he mentioned he dwelt with particular emphasis on the old Abbey of Selby, the nave of which had been rebuilt in the same magnificent and beautiful style. All those works had been carried out in one spirit, and that was a spirit of intense perception of beauty of form and striving after refinement of detail. It had not been in architecture alone that that perception and realisation of beauty of form was visible, for in the subsidiary arts, wood-carving especially, it was equally to be seen. Their style, although the workmen of that period did not know it, was founded on the antique Grecian style, of which probably they had never heard. They had not succeeded so well in the representation of the human figure; but in sculpture, in stained glass, in metal work, and in decorative painting, they had never been equalled. Referring again to the subject of architecture, he said that the beautiful Abbey of Selby was composed of the work of no less than six different periods, all of them characterised by an intense love of the beautiful and hatred of everything else, for they had introduced nothing that was not beautiful in the highest degree; and, at the present day, with all our mechanical and scientific appliances, we failed to equal the works of those less civilised and less polished periods. Then, without going any further in speaking ill of our own times, he would say, let them inquire what was the best means of getting out of that most humilating state of things. He believed that the foundation of the South Kensington Museum and the many schools of art connected with it had been the beginning of a reformation of that miserable state of things. His advice, therefore, to young persons who were not already members of that institution was to join those schools of art at once. He believed that that was the very best advice he could give them; but he would add that they ought not only to join the art classes, but also to become serious and determined pupils. He then dwelt at considerable length on the importance and necessity of the pupils placing themselves under the direction of the master, and not attempt to strike out a new line or course of study for themselves until their teacher had intimated to them that they might do so. Copying, too, although it was merely the drudgery of art, was of the highest importance; and he urged upon the pupils of the art classes to be most assiduous and painstaking in that respect. He was trying to give them his best ideas on the subject; and he did hope that the art schools of this country would do something to redeem this age and this country from the discreditable position which it now held with respect to art.

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ANCIENT MURAL PAINTINGS AT SOUTH LEIGH.

LAST month the parish church of South Leigh, near Oxford, was reopened, after restoration. The church has been entirely reseated and refloored, heating apparatus introduced, walls and windows repaired and partially rebuilt, rood-screen repaired and painted, and other renovations carried out—the nave, under Mr. Clapton Rolfe; the chancel by Mr. Christian. The paintings on the rood-screen and new altar have been executed by Mr. Sidney Gibbs. On taking off the whitewash on the walls some remarkable wall paintings of the fifteenth century came to light. Information of this discovery was sent to Mr. Coningsby Sibthorp. He immediately sent down Messrs. Burlisson & Grylls, of Newman-street, to report on the feasibility of their renovation. The report was favourable. The paintings (in distemper), though faded, were quite capable of recovery, and Mr. Sibthorp undertook, at his own expense, the charges of the work. The following is a description of these paintings as now to be seen in the church:—"1. Over the Chancel-arch.—The Resurrection. On the north side, the saved; on the south, the lost. Two Archangels descend from the clouds right and left of the arch, blowing the trumpets of the doom. The Archangel who descends to summon the saved is clothed in white; the Archangel who summons the lost is in dark raiment, as of mourning. Eighteen naked figures rising from their graves represent the saved. Among them a king and queen (the king close to the corbel) in their crowns (the queen just above him), a Pope in his tiara, a bishop in his mitre, a monk with the tonsure, a merchant with the cap of maintenance (bottom of the picture), &c. Above them a scroll inscribed 'Venite, benedicti, Patris mei.' On the south side of the chancel arch the lost are represented. In the upper part of the painting three figures rise from their graves weeping and lamenting. In the lower part of the painting a group of figures is being dragged down to the open mouth of Hell by a chain round their waists drawn by evil spirits of bestial form. The group of the lost which is in the power of these evil spirits contains twelve figures; among them a king, a queen, a nobleman, a monk, and a bishop. Above the painting is a scroll containing the words 'Discedite, maledicti.' Satan himself is depicted here in the form of a serpent, commanding the evil spirits. 2. North-East Wall of Nave.—The Gates of Heaven. S. Peter with the keys. Six naked figures come up to the Apostle, the foremost of whom, who is crowned, he takes by the hand. He is habited in a black cope with morse. Behind, an open archway with groined roof in a castellated building, over the battlements of which are seen angels with outspread wings. The spires and shrines of the heavenly Jerusalem in the background. 3. South Wall of Nave.—The Weighing of Souls. A painting, 10ft. 11in. high, representing the scene described in the twefth chapter of the Apocalypse, wherein the Church, symbolised by the woman clothed with the sun and with the moon beneath her feet and the twelve stars round her coronet, is introduced in combination with S. Michael the Archangel. The latter wields his sword above his head, and his golden wings outspread stretch across the field of the picture. His combat with Satan is represented by the scales which he holds in his hand, wherein he is weighing a saint against an evil spirit. The latter is weighing light, and blows a trumpet to summon his fellows, who are flocking to his assistance from the open mouth of the dragon in the bottom corner of the painting at the right hand. The two main figures of this painting are very striking. The woman with her bright flowing hair and golden coronal, surrounded by the twelve stars, her robe emblazoned with golden suns, and the moon beneath her feet, and S. Michael, with the cold gaze of the passionless Archangel, are figures not easily forgotten. The rich border round this painting (similar in detail to those in missals of the period) will be noticed. The birds in the rich diaper eastward are supposed to represent the cognisance of the Perrot family, formerly resident in North Leigh. The head of the family was a natural son of Henry VIII., and was Viceroy of Ireland. 4. North wall of Side Aisle.—S. Clement of Rome, bishop of that city in the apostolic age. He is represented in full episcopal vestments, chasuble, dalmatic, stole, alb, gloves, mitre, with crozier in his left hand, in the act of giving his blessing with the right. The symbol of his martyrdom, the anchor, is attached to his right wrist. He is said to have been martyred by drowning in the Crimea. 5. East Wall of Chancel, south of east window.—The Annunciation. The Blessed Virgin stands looking upwards, with her symbol, the lily, in her hands. The Dove, symbol of the Holy Ghost, descends upon her. This painting is the latest in the church, more variety of colour being introduced in it than is seen in the older ones. The oldest in the church are 'The Resurrection' and the 'Weighing of Souls.' Later paintings were taken off the walls before arriving at these, all being under several coats of whitewash."

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SLATE QUARRYING AND MANUFACTURE IN AMERICA.

VERMONT is distinguished in North America for the best and most extensive deposits of slates, and the region known as Lake S. Catherine is remarkable for its inexhaustible quarries of argillaceous slate, the commercial value of which is just beginning to be appreciated. From the rude Fairhaven school slates, this hardened clay has risen to an economical importance that puts it into competition with the choicest marbles. The quarries do not run several hundred feet deep like those of Wales, and are consequently worked with greater facility. Large blocks are blasted out and split with wedges, then raised with derricks, and separated into smaller slabs by blows from a wooden beetle. The roofing slate is wet in order to facilitate splitting, the thinly laminated formation rendering the process an easy one with the chisel. It is not expedient to take from the quarry more than can be readily split, as the slate splits more freely when fresh, although it is said that frost will restore the splitting property.

A great impetus has been given to the American slate trade by the demand which the Chicago fire has created, especially for roofing and tiling. The slate companies interchange products with the marble companies, for interspersing white marble with dark slate for floors. Slate is rapidly taking the place of marble for interior decoration; but so long as their extensive forests remain, the Americans will not need to substitute it for wood, as we do.

For ornamental purposes, the slate, after being properly cut and trimmed, is scoured with pumice stone, then rubbed with powdered pumice stone, and polished with felt. It is now ready to be transformed into marble. The slabs having been prepared, and painted with the groundwork colour, they are ready to dip. A vat is at hand, containing water. A man dips a small brush in oil colours, and sprinkles it on the surface; then he fans the water with a palm leaf, and draws the brush through it several times. The oil-mixed paint spreads on the surface of the water, like the veining in marble, and the slab being gently raised against it receives the impression. A mere change of groundwork and colours gives the varieties of marble—Egyptian, Spanish, Galway, Pyrenese, &c. The most elaborate work, as for altar-pieces, chessboards, and borders, is done by hand. After the application of colours, successive bakings and polishings finish the work. The imitation of marble in slate is employed for coffins, caskets, table tops, mantels, billiard beds, lamp-stands, and innumerable domestic and ornamental uses. The best workmen in Vermont are from Wales, having learned the business in the immense quarries of Carnarvonshire. These slates are not inferior in quality to those of Wales. The quarries are comparatively shallow, but more easily worked, and they are said to be too numerous and extensive to be exhausted by a single generation.

DR. ACLAND ON HEALTH.

ON Monday Dr. Acland, F.R.S., delivered an address "On Health" at the meeting of the National Association for the Promotion of Social Science. He commenced his speech by remarking that the two Public Health Acts of the last two sessions appeared to have wrought a remarkable change in the social condition of this country. For the first time in the history of a country a first-class central office had been made for regulating the distribution of the greatly increasing population, and giving to the people the charge of their own health. Dr. Acland then proceeded to give a brief sketch of what was fundamentally comprised in the idea of health as entertained by those who had done their best to master the idea, and then considered the circumstances of this country in respect of that conception. The public health was that of a nation or people, which did not consist of health of individuals, but of those circumstances which affect the body politic. Why one nation was more healthy than another was accounted for by the fluctuating circumstances of the whole human race. The object of any sanitary legislation was to influence all these circumstances respectively—the health of individuals, the regulation of the circumstances of public health, the development of the physique of the nation, and watching the fluctuations of the human race throughout the globe. The fundamental idea of public national health was the consideration of man as a civilised, religious, and intellectual being, and nothing could be better than a wise education to keep him in health. He should not advance anything, but he should deal merely with man under the conditions of health. Some persons dogmatically stated that they were not to have large or small hospitals, but he said we must have every kind, because by experience, judgment, and skill we must produce the best possible sanitary conditions for the treatment of the sick. Their object was to hinder disease, and so promote health. Disease was a necessity as our world was constituted. They had to provide means for the treatment of disease, as well as for the preservation of health. Dr. Acland then spoke of the treatment of leprosy in Norway, whence he had recently returned, and he asked how much more complete ought to be regulations in richer countries. Norway had done a great deal, and he did not see why we should not do the same, for typhus and typhoid, cholera, and other epidemic diseases. With regard to cholera, he read from the *Times* of some stagnant water having been discovered as the cause of an outbreak of cholera at Weermeer. To obviate some kinds of disease a liberal supply of good water was necessary, and this could be obtained by storing rain water, from which a constant supply could be got. This means was applicable to wants of even small and detached cottages in most remote places. He asked what was health, and how was it to be maintained by the individual, the nation, and the world. Before answering that they must ascertain the circumstances and conditions of the individual, the nation, and the world, and he asked whether they really understood the most simple matters concerning our water and food, and whether they were adopting healthy or unhealthy means of cure, or even endangering their health by adopting universal laws for places where the climate and customs of the people differed. They had an amazing science of comparative health before them: but what were poor mortals to do? As far as England was concerned, Mr. Gladstone had handed them over to the Guardians, and he thought Mr. Gladstone right. The other day, at Oxford, Mr. Vernon Harcourt had stigmatised sanitarians as people of that breed who intermeddled with other men's affairs; but to this idle talk of Mr. Harcourt he replied that the true principle of government was to do for the people, not what they could do for themselves, but what they could not do—what the poor working man could not do, that the Government was bound to do. But some people who advocated a Minister of Public Health, who should be absolute in matters of health, were not aware of the great range of subjects with which he would have to deal. Dr. Acland then enumerated the subject-matters connected with national health that a Minister would have to deal with—namely, water supply, removal of refuse, control of buildings (new and old), sewage drainage, prevention of overcrowding, prevention of infectious and contagious diseases, prevention of epidemics, formation of sanitary areas, registration of causes of death, registration of sickness as distinguished from death, the quarantinic superintendence of epizootic epidemics, the inspection of hospitals, penitentiaries, prisons, dispensaries, druggists' establishments, factories, and agricultural labourers; the placing of every district within reach of sanitary inspection by experts, education and registration of medical practitioners, national health, experts, nurses, and medicines, control of intoxicating liquors, mode of obtaining analyses of air, food, water, &c.; vaccination, coroners, rights of millowners to interfere with sanitary measures, and organisation of charities. There was not one of these subjects which did not form a necessary part and parcel of the highest subject-matter of Government care, if Government was to signify anything at all. He had put down organisation of charities last, but it was really a most important matter; and he said there must be a combination between the State powers and philanthropic individuals on the subject of preservation of national health, or we shall come to a dead-lock. In placing the administration of the Public Health Act of 1872 with the boards of guardians and town councillors, and dividing the country into districts, the Government had acted with great judgment. It was much better to proceed tentatively than wait till a complete system was developed. There was no such thing as finality about the subject. It was essentially progressive. It was absolutely necessary, however, that they should have scientific experts, and by those he meant not men who had failed in their profession, and merely wanted to take care of a Government salary, but competent men in their several departments—the Franklands, the Lethebys, the Jenners, the Hawksleys, the Brunels, the Stephensons. They wanted the highest scientific talent for the solution of the great question that the country could afford. They did not want a body of paid men, but a body of persons who shall be referees and paid by fees for their opinions. If these were appointed by guardians and town councillors the public would cheerfully defer to their authority. The central authority under the Act gave power to employ as many experts as the Treasury would sanction, and with these the public might rest assured that the nation's health would be promoted. He warned them against fettering the Government by adopting all kinds of schemes. The Government must proceed tentatively, and for his part he earnestly desired that no Public Health Bill would be introduced into Parliament next session. The power of the Government should be given to the great question of local taxation, for until that was settled they could not have complete arrangements for the payment of the new Council of Sanitary Officers, or even the assignment of their duties. Therefore, local taxation should be first approached. The magnitude of the work of the Local Government Board was so enormous that their officers should have the sympathy of the people in settling this great problem, and he hoped they would combine together in furthering them in making a permanent sanitary whole, and not a mere consolidation. Some people would blame him for a want of patriotism in making this suggestion. They disliked anything that had not the aroma of completeness about it, and he agreed with them; but they must not forget that they must proceed tentatively, for this was a progressive art. He believed that mental education, if properly applied, was the blessing of modern life; and if they ever pressed it to the injury of the body, it might become one of its greatest curses. The great qualities of a people, except in rare and exceptional instances, depended upon the physique of a nation. He appealed to historians whether it was not a fact that some of the highest human qualities had been shown in the most eminent degree in days when no writing and no systematic education existed. Holding these bold views, he said there was no possibility of exaggerating the importance to the world of the necessity of fostering and caring for the body of man, for it was not only the casket which contained the soul, but it was more than that—it was the casket which, under certain conditions, moulded and modified it. The casket might be injured by the vice or follies of parents, who might transmit to their children cursing and accursed disease, and, from the highest to the lowest, they might suffer from a want of patience, care, and kindness. They might, unawares, destroy that most precious gift of God, that health which enabled their minds to do the work of man—their duty towards their fellow-creatures, themselves, and their God.

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SANITARY PRECAUTIONS.

THE Clerkenwell Vestry has issued a notice directing the attention of the inhabitants to the importance of attending, especially at this season of the year, to the following sanitary precautions, recommended by the medical officer of health, whereby much disease and suffering may be prevented:—1. Great care should be taken that the water-butts or cisterns are clean, and provided with proper lids to keep out dust and dirt. No waste-pipe or other communication should exist between the water-cistern and the water-closet. 2. The traps to the drains should be kept thoroughly clean, well supplied with water, and the covers carefully kept in their places. The working of a drain trap depends entirely upon the presence of water; without this a trap is useless. 3. The closets should be thoroughly flushed with water daily. 4. The dust-bins should be frequently emptied; and any difficulty in getting the dust removed should be immediately reported to the Vestry. Every dust-bin must be provided with a lid. 5. The owners of cow-houses, slaughter-houses, and stables, must also take special care that no offensive accumulation of dung or offal, &c., is allowed to remain upon their premises. 6. One of the most important sanitary evils is overcrowding in dwellings, which enfeebles health, and is the principal cause of the great spread of, and mortality from, infectious diseases. The Vestry is determined to carry out the fullest powers of the law, and to inflict the penalties necessary for its suppression. 7. Those inhabitants especially whose families occupy but one or two rooms should pay great attention to the cleansing of the floors, the linen, and the clothes. Insufficient water supply should be at once complained of. Free ventilation is also very important, and the upper sashes of all windows should be made to open.

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HOW TO LIGHT SCHOOL-ROOMS.

OUR readers will remember a controversy in our July numbers on the best plans of lighting and ventilating schools. An esteemed correspondent, "H." (p. 39), maintained with substantial reasons that *top* lighting was the best. His position, as we thought at the time, was unsuccessfully assailed, and we now find his arguments singularly confirmed by Dr. Leibreich, Ophthalmic Surgeon in S. Thomas's Hospital. That gentleman, in a lecture recently delivered before the College of Preceptors on School Life in its Influence on Sight, says:—"The Education Department, in its rules to be observed in planning and fitting up schools, has made regulations for the lighting of class-rooms, and has chosen, of all the different kinds, the very worst. No. 15 of the rules is as follows:—'The windows should be so placed that a full light should fall upon the faces both of the teachers and of the children.' Light coming from the right hand is not so good as that from the left, because the shadow of the hand falls upon that part of the paper at which we are looking. Light from behind is still worse, because the head and upper part of the body throw a shadow on the book; but the light that comes from the front, and falls on the face, is by far the worst of all. In the first place, it does not attain the object desired; and next, it is most hurtful to the eye. The object is to make the fully-illuminated faces more visible to the master; but the children, instinctively desirous of avoiding the unpleasantness of the full glare, assume all sorts of positions, which turn their faces *from* the master. In reading, they turn the head round the vertical axis, generally towards the right, in order to let the light fall on the book, which, when held straight before them, is completely in shadow; while in writing, or in reading (the book being on the table), they bend their heads as low as possible, in order to shade their eyes by the projection of the forehead. In this way the faces are much less visible to the master than if they were held upright and illuminated from the left side; and if, according to the regulations of the Committee of Council, the light also falls full upon the face of the master, he will be entirely prevented from seeing them. This method of lighting the room is very injurious to the eye, because, firstly, the retina becomes fatigued by the full glare upon it, and the diffused light renders the comparatively dark images of the printing and writing more difficult to be perceived. Secondly, the position assumed by the children in order to avoid the disturbing influence of the light places the axis of the eye in a very unfavourable direction, which, as I have already mentioned, and shall explain more fully by-and-by, induces short-sightedness, differences in the sight of the two eyes, and certain weaknesses of the muscles of the eye. The motives of this diversity in the lighting of rooms cannot easily be given, as they are different in almost every school. I will, however, mention a few of the more prevalent. Some of the principal schools are in buildings, two, three, and even four hundred years old. Here the windows are not in the most desirable positions; comparatively speaking, however, the lighting in the large class-rooms is very good. They have high Gothic windows, and the light falls through them more directly from above. The more directly the light falls from above, the less is felt any fault with regard to the side from which it comes. In small old buildings the lighting is frequently very bad. This would have been of little consequence where the old building serves merely as a nucleus for new ones, were it not that the unfortunate idea of building the new part in the old style has deprived the children of the favourable opportunity of obtaining several well-lighted rooms in addition to a small number of badly-lighted ones. If we have to condemn this sacrifice of a most important object to architectural taste, what shall we say when one of the first architects in England builds, at an enormous cost, a perfectly new, large, splendid school on an extensive piece of ground, open on all sides, and lights every class-room from three sides at once by low broad windows; thus rendering it impossible to place the desks in any suitable position? Are trustees and architects aware of their responsibility, when they build a school without consulting the masters, and only for outward show? Or have they no misgivings of the evil consequences resulting from such unpractical arrangements in a school? In the schools of the middle classes I have generally found better arrangements with regard to light, especially where limited means did not allow the architect to ornament the house in the Tudor style, in which the upper part of the window, *i.e.*, the most important, is useless, but obliged him to build in a simpler manner. Buildings with rectilinear and rectangular ground plan, with high, rectangular modern windows, do not produce such a pretty effect in the landscape, and do not proclaim the genius of the architect to the superficial beholder; but this seems to me of small consequence in the case of institutions of such practical importance as our schools. In the schools for the poor, where the light depends essentially upon the situation and means of the school, and where the first is often unfavourable and the latter limited, no one can be blamed for the lighting, which is generally insufficient rather than ill-arranged."

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SEWAGE POISONING.

A PAPER by Mr. P. H. Holland was read at Plymouth, in the Health Section of the National Association for the Promotion of Social Science, by Mr. Michael, Q.C., on "What steps should be taken to guard against sewage poisoning?" No collection of filth should, he said, be allowed anywhere under any circumstances. The only safe course would be the immediate removal of every disgusting subject, and to take care that none lodges by the way, as it was less from sewage than from its deposit that danger and annoyance proceeded. As little foul air as possible should be allowed to form in the sewers, or, if it did, it should escape where there was the least mischief. He advocated the free ventilation of sewers outside the dwellings, and the absolute non-connection of the sewers with the internal parts of the house. Mr. J. N. Stevens, M.R.C.S., in another paper, advocated drains being made of Portland cement: they should be at such angle as would allow the rapid flow of sewage to outfalls. The interiors should be smooth. The sewers should be oval. He objected to the use of pipes for carrying off the gases, believing the foul air would be carried in at the windows if they were used. The sewers should be disinfected with charcoal or chloralum. In the discussion Dr. Hearder pointed out the difficulty of carrying out the chemical means proposed, and said the bringing up pipes from the ground to the tops of the houses would be impracticable. He did not see why in some places large shafts should not be used for carrying them up. Dr. Hardwicke, medical officer of health for Paddington and Bayswater, objected to the ventilation by pipes, and believed the practical remedy against gases was flushing with a proper water supply. Dr. Nankivell thought the best plan was to have short pipes placed into sewers at no great distance from each other, which might intercept the foul air in its passage. Mr. Bulteer, F.R.C.S., drew attention to the necessity of proper supervision in the laying of drains, pointing to cases where wells had been poisoned through carelessness in regard to this. Mr. E. Vivian was in favour of tall shafts, but would have them so constructed that the weather or lee scuppers should be opened according to certain winds. Mr. Michael pointed out that the great thing was to have no connection between sewers and human habitations. Mr. T. Baker, barrister, read a paper on the prevention of disease. In the discussion that followed Dr. Shrimpton said diseases were not contagious except under those conditions and in those places where they may be produced. Dr. Hardwicke expressed regret that under the late Government Bill no provision had been made for appointing properly qualified veterinary surgeons, engineers, and it might be analytical chemists, to act in conjunction with the medical officer of health. Earl Fortescue entirely agreed that it would be most desirable that medical officers of health should have the assistance of veterinary and engineering skill at their disposal.

MASONRY AND BRICKWORK.

We recently reproduced an article from *Engineering* on the Strength of Brickwork. The following remarks are reprinted from the same source:—

However gigantic may be the strides with which engineering science has advanced during the last few years, it cannot be denied that, so far as regards the special art of building in masonry or brickwork, the present race of architects and engineers are feeble in conception, timid in execution, and but dwarfs of utter insignificance as compared with the giants of former days.

It would be amusing, or more truly perhaps the reverse, to note in what manner an average architect or engineer of the present age would deal with some of the problems presented to the old masters—for instance, such a one as that successfully solved by the Saracenic builder of the justly celebrated tomb of Mahomet at Bejapore, India, which was as follows: Given a building 135ft. sq. on plan, and 110ft. high, required to cover the same with a circular dome 124ft. in diameter, and weighing some 12,000 or 14,000 tons. It would be curious to observe how many hundreds of tons of iron our men would consider it imperative to throw into the work. The Saracen, knowing the capabilities of his material, asked for no ironwork, but fearlessly trusted to his masonry, and skilfully corbelled out the square walls at the top to meet and support the circular dome, and to such a bold extent, that at the angles of the building the projection of the corbelling measured no less than 46ft.

How infantile appear the greatest exertions of our modern building in comparison with such mammoth works as these. The traditions of the art have been lost, and science has provided no substitute. Our professors, if they do not avoid the subject altogether, treat it in a perfunctionary, *ignotum per ignotius*, manner, which only serves to make the "darkness more visible," or the "little glooming light"—which may already exist in the student's mind—"more like a shade." We may be taught, for instance, that the line of pressure in an arch must be included in the middle third of its depth, or the arch will tumble down, and we may be treated to many other equally shallow *dicta* based upon hypotheses evolved from purely theoretical considerations, which the bare existence of hundreds of buildings for hundreds of years conclusively demonstrates to be utterly false and untenable.

In recent times, no doubt, the introduction of ironwork has had much to do with the extinction or suppression of nearly all that is true and expressive in the art of building. It is so very easy to multiply the span and divide by the depth, and to perform the other elementary operations incidental to the determination of the strength of an iron girder; and then, besides, the figures and diagrams look so clever as to induce in the too often shallow performer a glow of self-complacency, leading him to fervently believe that an engineering feat has really been achieved. But if such work constituted engineering, the schoolmaster in the "Deserted Village" would be an admirable exponent of the science—

> The village all confessed how much he knew,
> 'Twas certain he could write, and cipher too.

Another advantage offered by ironwork as compared with masonry, and one to indolent or incompetent men peculiarly seductive—is that of shirking responsibility. With iron girders the designer may devote the few minutes necessary to the conventional calculations, specify iron of a given strength, and so rid himself lightly of any further sense of being responsible. But if, on the other hand, his first consideration is his client's interest, and not his own ease, he will often be led to discard ironwork in favour of masonry, and he will find no royal road to learning in that direction, but must honestly and laboriously qualify himself by theoretical and practical investigation, and by comprehensive analyses of works already executed, to form a correct estimate of the capabilities of the masonry or brickwork with which he may be dealing, and to shape his design accordingly.

Notwithstanding the eclipse which constructive masonry has suffered by the advent of ironwork, a very important part is still reserved for brickwork to play. The value of the brick dwellings and other structures annually erected in this country far exceeds that of any other similar class of work, railway or otherwise. How trustworthy a material brickwork is may be considered self-evident when it is remembered that amongst the hundreds of thousands of brick houses in progress or in existence, the fall of one rarely or never occurs unless it be either very old and decayed, or young and green, and this, notwithstanding the disadvantage these structures labour under in being proportioned as regards strength by mere rule of thumb, or by no rule at all. Our architects have, in one small respect, improved upon the practice of their immediate predecessors by reason of the omission in their buildings of that potent agent of destruction—timber bond. They have learnt that modern bricks and mortar can be made to rival in durability any material that the Romans employed, and that the alleged peculiar virtues of ancient mortar are mythical, or due solely to age. Good bricks and mortar, when once in place, require no painting or further attention, and instead of deteriorating, like ironwork, brickwork positively increases in strength, to an appreciable extent, during the course of many years. In fact, so many advantages, as regards cost and durability, are offered by brickwork, that the rush upon ironwork made by the second-rate men of the engineering and architectural professions is much to be regretted, both in the interests of the art of building itself, and of its patron's pockets.

A little knowledge is proverbially dangerous. It is, therefore, no matter for surprise that so-called utterly ignorant country builders are, as a body, more just to their clients than many pretentious but half-informed professionals. The absence of classified experimental data relating to the properties of brickwork may be urged by some as a valid excuse for the indifference or ignorance evidenced by the latter body, but this argument cannot be sustained. Many experiments are not needed, for, if the eyes be but kept open, the thousands of houses which are continually being run up by speculative builders, with their numerous small but suggestive defects, readily traceable to defective design or materials, or to both conjoined, furnish the thoughtful observer with data for generalisation of far greater value than could be obtained from the most elaborate series of experiments.

Looking broadly at the respective practices of engineers and builders when dealing with brickwork, it may be said that engineers, in their calculations, treat their bricks as so many Lilliputian blocks of stone piled upon each other, and kept in place solely by the action of gravity, whilst builders, on the other hand, treat them as so many blocks of more or less irregular shape firmly glued together into one solid mass. Engineers act upon the latter theory by compulsion, when dealing with concrete; but the extensive use of the latter material in recent times has not made them a whit less exacting in the precise arrangement of the spiral courses of a skew brick bridge, or in many other farcical niceties of a similar nature.

The daily personal experience of practical builders has formed the basis of their theory, and they know the conditions to be complied with in order to insure success. Brickwork laid in irregular courses, arches with theoretically inadequate abutments, and concrete structures of any class, will tumble down if not sustained by extraneous aid when young and green, and yet a few days or a few months later they may be possessed of a surplusage of power to undertake any duty which may be imposed upon them. Builders know this truth, and act upon it; hence it is that in so many cases where an engineer would introduce ironwork, the builder simply substitutes sound cement for his ordinary mortar.

Few things can be more instructive to an earnest student of constructive art than to note the various shifts and contrivances practised by a speculative builder in carrying out such a work, for instance, as a row of shops, when conditions of a pecuniary nature necessitate everything being cut down to the lowest margin of strength that his experience can justify. The whole front of the buildings, for some hundreds of feet perhaps in length, will be carried upon a series of light timber breastsummers, resting at each end for a length of 4in. upon the party walls, and propped up temporarily at some intermediate point by a thin story post, which has sprung very probably 2in. or more at the centre, in consequence of the excessive weight thrown upon it by the green brickwork. At the corner the building will present the fearful and wonderful appearance of a house built upon a Brobdignagian kitchen table, and only prevented from plunging off the table to its own destruction by the gentle persuasion of a couple of slight raking struts temporarily fixed at the angles. So appears the row of buildings for some months, whilst the internal finishings are in progress, and then comes the time for the striking of the struts and the setting up of story posts, to be followed by the putting in of shop fronts and the general polishing up of the exterior, when the building presents the appearance of those to which the public are accustomed, into which they enter, and in which they dance about without the slightest trepidation or suspicion of ever so small a risk.

Now, if this model row of shops were submitted for report to an average young engineer fresh from King's College, he would conclusively demonstrate to his own satisfaction that the building could never stand; that the breastsummers were loaded nearly up to, or perhaps even beyond, the breaking weight; that the bearings at the ends, instead of being mere ledges of 4in., should be broad and substantial bed plates; and that by reason of the unequal strains induced by the weight of the entire front of the house, together with that of the floors and roof resting upon it, being thrown upon the extreme verge of the party walls, the brickwork at those points would encounter strains which it is utterly incapable successfully to resist. The building does *not* come down, but our young friend will simply disclaim any responsibility for the inexcusable conduct of the building in that respect, and, proudly conscious of the immutability of mathematical laws, and of his own proficiency therein, will content himself with reasserting his theorem that the building ought to fall. This conclusion is, of course, essentially indolent and unscientific; the truly scientific course to adopt would be to endeavour, by a process of induction, to reconcile the apparent discrepancy between theory and practice.

The elements of reconciliation will be found in the fact that brickwork is possessed of many valuable attributes which are taken advantage of by the builder, but are ignored by the engineer in his calculations, although not unfrequently they generously come to his aid, and save his credit in cases where he has hopelessly blundered even in the application of his own theory. The modern class of builders have arrived at their present position by a tentative process. At one time, a so-termed brick house consisted in reality of a self-sustaining timber framework filled in with brick panels, and at a more recent period bond timbers were introduced wherever the fancy of the architect dictated. The superstition that these bond timbers performed an essential function would appear to enjoy a flickering existence even at the present time, for in one of the most recent and important additions to railway works in the metropolis, hoop-iron bond was extensively introduced in almost every conceivable position—for instance, in courses parallel to the abutments throughout the entire length of the arches, although they might be so long as to resemble a tunnel. This, happily, is rather a unique specimen of railway practice, but it serves well to illustrate the direction in which engineers commonly err in their estimate of the capabilities of brickwork.

ARCHÆOLOGICAL.

Rome.—A letter in the *Swiss Times* gives an account of some discoveries which have been made in the Forum. Some workmen were demolishing the foundations of a Mediæval tower when they came upon what at first seemed to be a block of marble, with a bas-relief upon it. Scarcely had the workmen commenced to clear away the accumulation from around the end projecting from the foundation of the tower, than, at a distance of six paces, they uncovered a second slab, exactly corresponding to the first, and, like it, sculptured on both sides. The new discovery consists not only in the restoration to light of four large and remarkably fine alto and bas reliefs, but in the fact that these reliefs have been found *in situ*, and form part of some edifice, erected, as the style of the sculpture proves, during the first half-century of the Empire. What edifice this may have been there is nothing yet to show; no doubt the alto-reliefs have reference to the purpose for which it was built, but their subjects are still an enigma. The catalogues are believed to name all the structures upon the Forum, and they do not say anything about such a construction as this, which is simply two exceedingly handsome marble balustrades, each about 6ft. in length, standing opposite to each other, and forming a kind of passage complete in itself, for they terminate in square pilasters finished off at each end. They stand on a basement or platform of travertine, which raises them about eighteen inches above the level of the Forum, and their direction is across it. Each balustrade is sculptured on both sides; on the inner sides by representations of animals, the same on both; a hog, a sheep, and a bull, following each other, garlanded and decorated for sacrifice. On the outer sides are alto-reliefs of many figures, representing events connected with the history of Rome or her political institutions.

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The Local Government Board has issued an order assigning to the Corporation of the City of London all the duties connected with the sanitary inspection of the port of London, and especially that of appointing a legally qualified medical practitioner to be the medical officer of health, and also a competent person to be an inspector of nuisances.

BROTHERHOOD HALL, STEYNING, SUSSEX.

IN this, the season of archæological and other excursions, it may not be out of place if we briefly give a few notes of the buildings visited on Saturday, August 17, 1872, by a party selected from members of the British Association meeting at Brighton to visit Steyning. Although started under the auspices of scientific research, it was essentially a pleasure excursion, each being allowed to follow his own bent. The route chosen was *viâ* Shoreham; the first halt being at the strange old parish of Aldrington, which is possessed of neither church or vicarage, and having but two inhabitants—the tollgate keeper and his wife—in the year 1831, of whom it is said the man first lost his leg and then his partner, so that taking into account his physical deficiency, the actual population of the parish was three-quarters of an inhabitant. (Lower) Hangleton House, hard by, however, deserves mention in passing. The mullioned windows, massive chimneys, and other details of this house indicate its style to be Elizabethan or Early James I. For upwards of 150 years it has been occupied as a farmhouse, and reduced to its present state, though its general appearance and remains of foundation walls, which can be extensively traced, show that the building was originally much larger. The rooms internally are spacious, having ceilings enriched with the armorial bearings in parget work of Richard Bellingham, who was Lord of the Manor in 1594. At one end of the kitchen is the following quaint verse under the Ten Commandments, which are curiously carved on panels of oak:—

Persevere ye perfect men,
Ever keep these precepts ten.

Leaving Shoreham, Beeding, and Bramber, through which we passed for a visit on the return journey, we soon arrived at our destination. The extensive works of Mr. Chappell, the contractor, were first visited, where for some time the excursionists engaged themselves in examining the machinery and appliances employed in the production of joinery by steam power. The rapidity with which doors and sashes are made testify to the value of such mechanical discoveries. The church was next proceeded to, where the party was met by the vicar, the Rev. T. Medland. It is supposed that two churches existed in the parish at the time Domesday-book was compiled. That erected on the site of the present building was dedicated to S. Cuthman, an Anglo-Saxon Saint, whose remains were interred here, but afterwards removed to Winchester Cathedral. Here, too, Ethelwolf, father of Alfred the Great, was buried. The church, as it now stands, consists of west tower, nave with north and south aisles, and a chancel. The tower was built about the middle of the sixteenth century, a considerable portion of the more ancient structure being built in its walls. The nave—a beautiful example of Norman work—is a fragment of the conventual building built in connection with the Abbey of Fêcamp, with the Church of Granville, in Normandy, as a model. In Britton's "Christian Architecture of England" an elevation is given of the nave arcade and clerestory. It seems that the nave arches were originally of square masonry, and subsequently enriched, as the work of various periods is observable, and even some Early English details occur throughout the work. Externally, the clerestory windows on the south side are peculiarly rich, with a good corbel-table above; these have fortunately escaped the restoration which the church has undergone internally. The aisles are lit with windows of the fifteenth century, and are spoilt by modern galleries. Between the nave and the chancel are arches evidently intended to carry a central tower. The chancel is modern, rebuilt with Early English details, the old choir having been demolished, with the transepts and western portion of the nave, on the general suppression. The font, a good specimen, is Norman, of green Sussex marble. The Building News for February 23, of the present year, contains our sketch of an oak bench existing in this church. The Vicar next conducted us to the Rectory House, "a good specimen of a parochial manse," containing some excellent wainscot panelling, richly carved with the arms of S. Richard of Chichester, Fitz James, Bishop of London (1505); the dragon and greyhound of Henry VIII., and the Tudor rose of his Queen, Catherine of Arragon, together with fleurs-de-lis, lion rampant, clusters of grapes, &c. In the garden two stones exhumed with the relics of S. Cuthman were pointed out. They are incised with crosses of exceedingly rude character, and evidently belong to Saxon times. Taking leave of the Vicar, to whom we are indebted for a considerable portion of our information, the party, with true English spirit, repaired to the hotel for lunch. The town was once of ancient commercial importance, though now reduced to almost a village. It contains several houses, which exhibit architectural features worthy of notice. Our sketch of the "Churche Streete" and "Brotherhood Hall," made during the visit, and given as one of this week's illustrations, is an example. This "Brotherhood Hall" belonged to an ancient guild or fraternity, of whom we can learn but little. The endowment of a grammar school in connection with it in 1614, by William Holland, an alderman of Chichester, with full particulars of their estates, in 1548, are given in local histories, but no information has been recorded of the Brotherhood itself. The hall, from the mouldings of the woodwork and window mullions, was built about the middle of the sixteenth century. It is now used as a school. The word for retracing our steps being given, we soon found ourselves among the precincts of Bramber Castle. The remains now standing, which chiefly consist of the gateway tower in ruins, are of Norman masonry, built by William de Braose at the end of the eleventh century. It occupies a site of considerable elevation, commanding an extensive view of the surrounding country. "This spot has evidently been adapted," as Mr. Durrant Cooper has remarked, "by the Roman, the Saxon, and the Norman, alike to their changing wants and necessities." The church presents little worthy of notice. It consists of cave and tower, the chancel and transepts having been destroyed. On the south side, however, is a good Norman doorway. The street of Bramber, with the picturesque fragment of its castle in the rear, presents a scene seldom to be met with, and is a favourite resort of the artist. Next, passing through Beeding, a small unimportant village, our attention was attracted by houses with mullioned windows of moulded wood (sixteenth and seventeenth century). The church, like that of Bramber, having little of architectural interest, was not visited, especially as the churches of Shoreham were in view. That of Old Shoreham (S. Nicholas) is a simple cruciform structure, having a central tower. The interior arches are highly enriched with zig-zag ornament, but the windows being very small, the church is very dark within. There are tie-beams in the chancel, carved with "tooth moulding," an enrichment seldom found executed in wood. The well-known and justly-appreciated church of S. Mary, New Shoreham, was the next and last place of halting. Here we were met by one of the churchwardens, who kindly described the building, and distributed a printed report for the restoration of the church. The manner in which Sussex churches have generally been restored causes one silently to hope that the day is far distant ere this splendid specimen of Transitional work undergoes such a process. Having already described New Shoreham Church in the Building News (July 28 and December 8, 1871), a sketch from the north-east, and a measured drawing of the east end, being given, a description now is unnecessary. A section of the choir arcade and clerestory, is published by Britton, with that of Steyning. The party now returned to Brighton thoroughly delighted with the trip.

Maurice B. Adams.

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A PHILOSOPHER'S OPINION ON MODERN ECCLESIASTICAL ART.

MR. HERBERT SPENCER, in an intensely interesting article on "The Study of Sociology," in the last number of the *Contemporary Review*, in speaking of the tendency of Puseyism, says:—

"The English of the Bible is of an older style than the English of the date at which the translation was made; and in the Church service various words retain obsolete meanings, and others are pronounced in obsolete ways. Even the typography, with its illuminated letters of the rubric, shows traces of the same tendency; while Puseyites and ritualists, aiming to reinforce ecclesiasticism, betray a decided leaning towards archaic print, as well as archaic ornaments. In the æsthetic direction, indeed, their movement has brought back the most primitive type of sculpture for monumental purposes; as may be seen in Canterbury Cathedral, where, in two new monuments to ecclesiastics, one being Archbishop Sumner, the robed figures recline on their backs, with hands joined, after the manner of the mailed knights on early tombs—presenting complete symmetry of attitude, which is a distinctive trait of barbaric art, as every child's drawing of a man, and every idol carved by a savage, shows us."

HALF-TIMBERED HOUSES, DITCHLING, SUSSEX.

THIS ancient and picturesque village is situated almost immediately beneath the range of South Downs, which form a glorious background to the scene, and render it well worthy of a visit from the artist, while the church and old houses scattered throughout the town deservedly attract the attention of the architect. In the time of Alfred the Great, who held an extensive range of land here, "Deccaling" was the name given to the parish, derived, it is thought, from that circumstance; the Anglo-Saxon "dykening" signifying an enclosure. It was in this ancient and royal park that Edward II. kept a stud of horses. This is gathered from one of the letters of that prince from a MS. in the Chapter-house, Westminster: "Brother John de Burne and Sir Oliver de Willet, executors of the Lord Earl de Warren, are entreated for the love they bear the prince, to give assistance more speedily to John de Dycheninge, keeper of the prince's colts (running at large in the park), in those matters in which the said Lord Earl was bound to him concerning the time in which he had served him." The plain interpretation of which is, as a local historian remarks, "that he would be obliged to them to pay his groom's wages." The advowson of the Church, conferred on Lewes Priory by William, the second Earl de Warren, was, on the dissolution of that establishment, with all the religious justice peculiar to Henry VIII., most graciously given by that monarch to his divorced wife, Anne of Cleves. The houses which form one of our illustrations were probably built by her, and formed the entrance to the royal park already spoken of. Tradition states that Anne occupied the house at the western end of the street, opposite the church; but, as it has been said, "Poor Anne of Cleves had as many places of residence and death as Oliver Cromwell had skulls." Indeed, the ludicrous stories current among the villagers of these old buildings are most amusing, one ascribing them to Alfred the Great, another to Gundreda, while others more wonderful are told, but will not bear repetition.

Maurice B. Adams.

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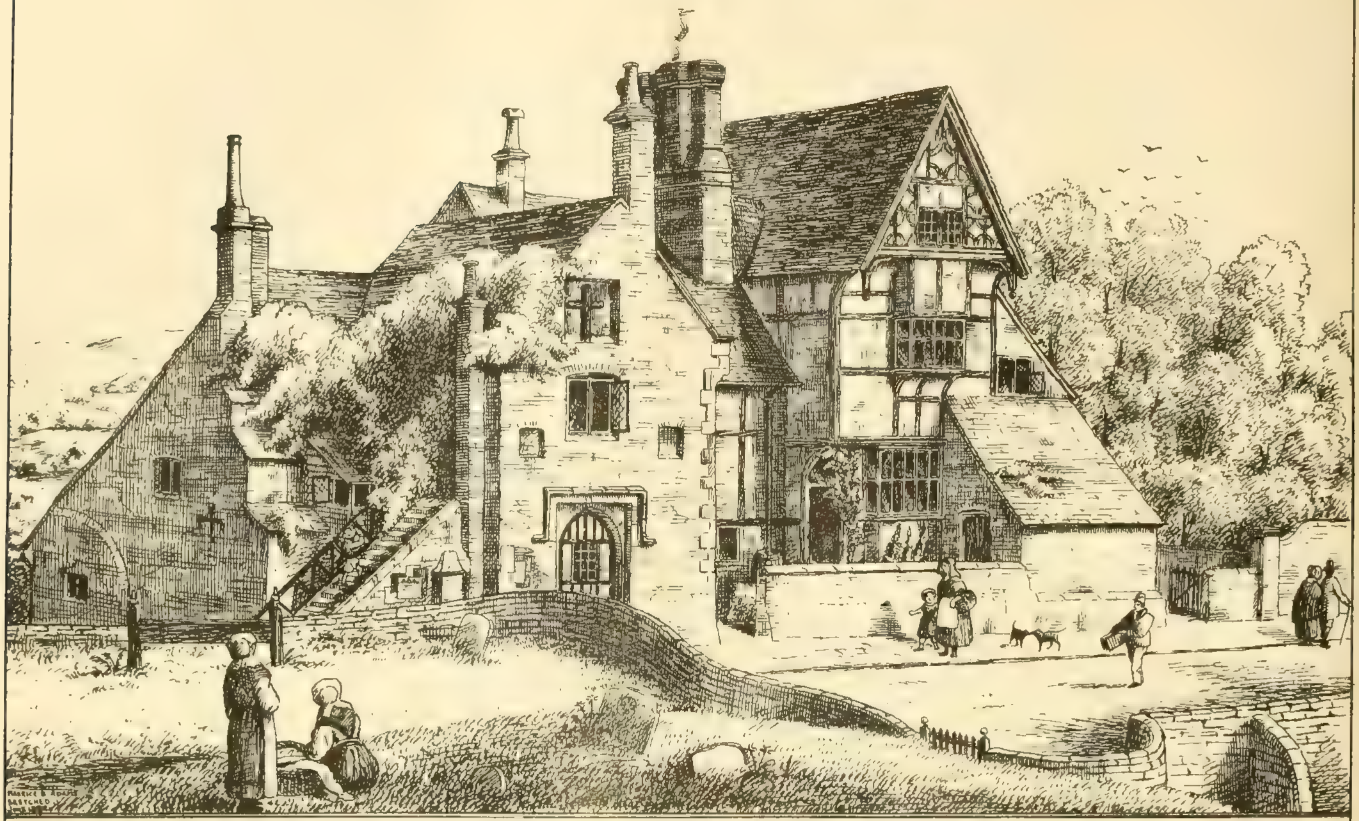
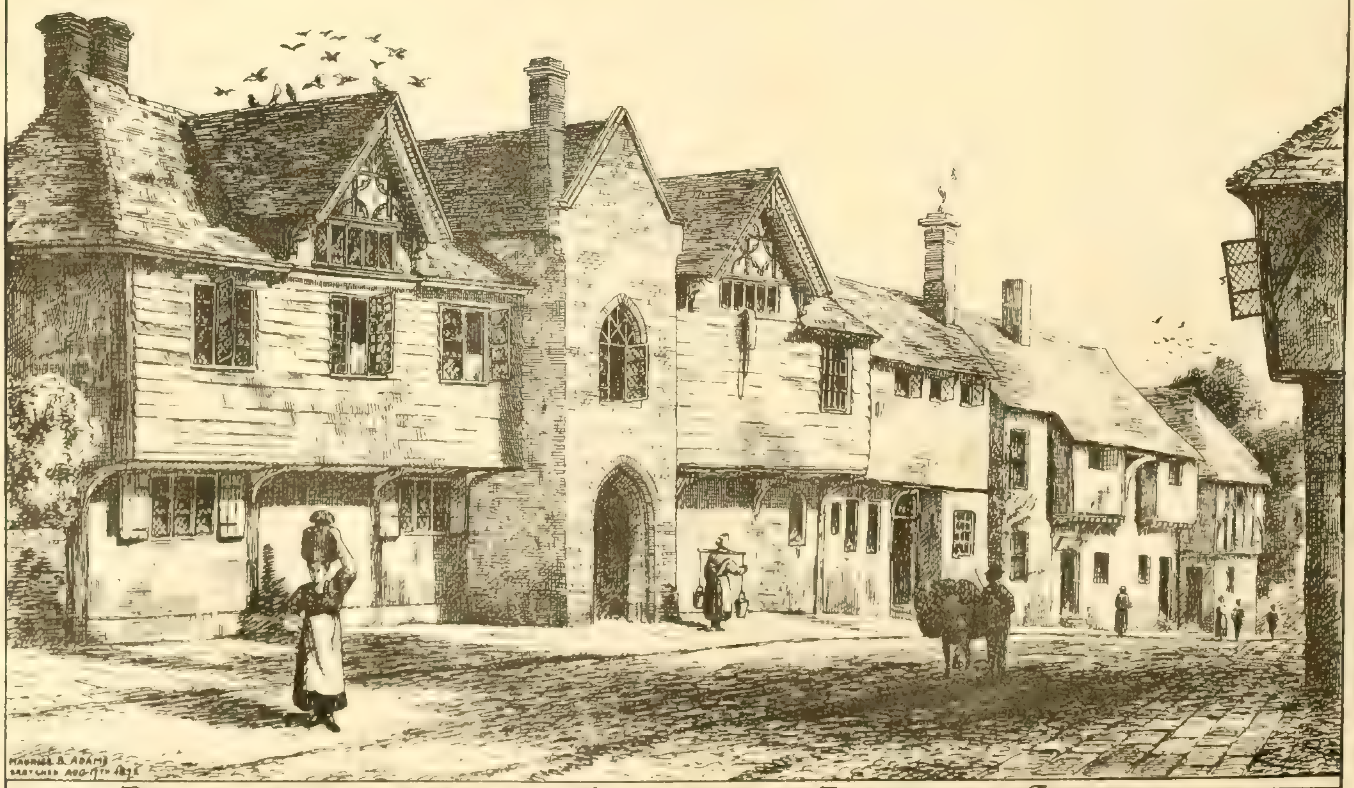
THE TOWER AND SPIRE OF S. MARY'S CATHEDRAL CHURCH, NEWCASTLE-ON-TYNE.

ONE of our photo-litho. illustrations this week represents the tower and spire of S. Mary's Cathedral Church, Newcastle-on-Tyne. Some time since a Roman Catholic lady bequeathed £2,000 towards a fund for defraying the expense of completing the spire, and about eighteen months ago the building of the present handsome steeple was commenced. The designs were furnished by Messrs. Dunn & Hansom, architects, of Eldon-square, Newcastle, and the whole work has been carried out under their superintendence, the contractor being Mr. Walter Scott. All the stone carving has been done by Mr. Roddis, of Birmingham. From base to topstone the steeple is 212ft. high, with a vane surmounting it 10ft. high, making a total height of 222ft. The style of architecture is the Decorated. The tower, which is 105ft. high, consists of three stages. The first stage is carried up to the ringing-chamber, and access to this chamber is obtained by a turret staircase; in the second stage it is intended to place a clock at some future time; and the third stage contains the belfry chamber, which is lighted by four richly-ornamented windows. The tower is finished off by an ornamental pierced parapet. The tower is 24ft. wide at the base, and 22ft. wide at the pinnacles. The spire is 19ft. in diameter at the base. From this tower a beautiful octagonal spire, 107ft. high, rises. At the base of the spire there will be four crocketted pinnacles, and on the top of each an emblematical figure. Within a short distance of the base of the spire are four lucarnes or garret windows, which stand on ornamented bands, and above these again are three bands of sunk ornamentation. Each angle of the spire is finished off with a beading, which adds greatly to the richness and originality of the design. When the erection of the steeple was commenced a twelvemonth ago, the cost was estimated at £2,250. Since then several alterations and additions to the design have been carried out, at an extra expense of about £300, making the total cost about £2,550. The portion of steeple built a quarter of a century ago cost £600, so that the entire cost of the erection will be about £3,150.



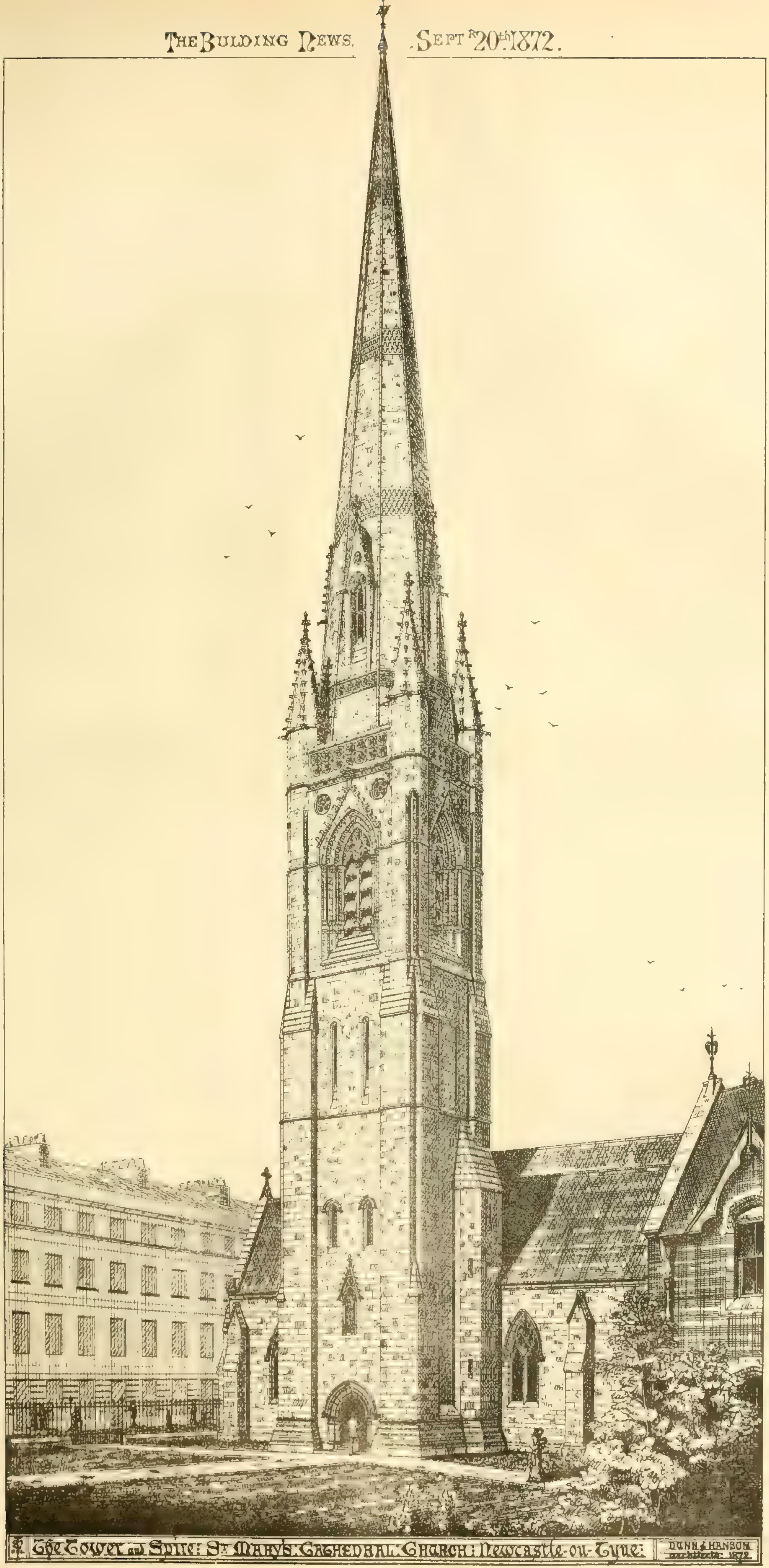
◉ HALF TIMBERED HOUSES DITCHLING STREET SUSSEX ◉



◉ BROTHERHOOD ◉ HALL ◉ STEYNING ◉ STREET ◉ SUSSEX ◉

Photo Litho Whiteman & Bass [illegible] Holb'n London

Sketched by Maurice B Adams Brighton



The Tower and Spire: St Mary's Cathedral Church: Newcastle-on-Tyne: DUNN & HANSON architects 1872

Photo Lith. Whiteman & Bass, 236, High Holborn, London.

THE STYLE FOR THE FUTURE.

Ex nihilo nil fit.—Although the apochryphal German professor sat down to evolve a description of the camel from his own inner consciousness, he would hardly have had the hardihood to have made the attempt unless he had at least seen a living, if pampered, specimen of the species waddle on the sward of some zoological garden. Would-be architectural reformers are, however, less modest and reticent, for they clamour for new styles, and prate about their arising out of the requirements of the age, as if the creative faculty was a most ordinary human endowment. It is noticeable that these ardent gentlemen are seldom architects who have had ample opportunities of putting their theories into practice, and though they may add the letters "F.R.I.B.A." to their names, and even sport the Royal Medal of the Institute, they are not widely known, except in the literary or surveying branches of their profession. Now, those who are accustomed to design as well as to talk about buildings, know well that they must study long and deeply the works of those that have gone before them ere they can presume to tread in their steps. History has no record that any one recognised style has been produced without reference to others; the transition from one to another has been most gradual, and hardly an ornament exists but its parentage is known.

Such having been the process everywhere adopted hitherto, it seems likely that the same will be repeated so long as architecture is required in this world. The requirements of successive ages being so various as they are, and likely to become increasingly so, they will, without doubt, modify the style followed by each, but the type chosen will be as recognisable by future antiquarians as those of past days are by the nomenclaturists of ours. We shall never again have the same clearly-defined, generally practised styles as of old, and it may be gravely questioned whether we need them. Style, after all, is but a language, and the world is becoming too cosmopolitan to object whether the medium of thought be High Dutch or pure Cockney or Parisian. It is the thought in literature and the art in architecture which alone are of consequence. If the kernel be sweet, we need not waste discussion as to the nature of the husk.

We are constantly being told that it is admitted on all sides that architecture is in a most unsatisfactory state. We venture to think that the main cause for this, if it be so, is that the world troubles itself too little about its buildings, and not that architects are unable or unwilling to give better things. There are many well-known accomplished men idle for want of commissions, while works are foolishly distributed among incompetent ones out of sheer nepotism. So long as this is the case it is unjust to pelt the profession with abuse. However, hard words break no bones, and ours is not the only section of the community that suffers from similar treatment.

But the outcry is that we are a house divided against itself; we should not, however, be unique among professions if this be true. It is only that we look from different sides at the same shield; the one view is as likely to be correct as another, and it would be well if the disputants would consent occasionally to compare notes. There are those who think that the architecture of the Middle Ages is the proper standpoint whence we should take our progress for the future, and of these persons some would nail their flag to one particular phase of Gothic, so that if Mr. Sharpe's sub-divisions obtain, there may be seven distinct parties claiming to be the champions of Christendom. Others protest the whole of these to be retrogressive, and would urge that they resemble Lot's wife in thus casting their eyes backwards, and bid them beware of a like fate to hers. Such allege that we should improve the architecture we have; but would be puzzled, we think, to give that a name. The *Vernacular*, which term has been invented for it, is hardly a sufficiently defined standpoint to work from. In so far as it is not Gothic, it is of some bastard order of Classic, or, perhaps, of the hole-in-the-wall style, of which Harley-street is an example as little doleful as any that could be adduced.

The Renaissance has no claim to be in particular the style of the age, and if it were so, its mongrel origin is clearly traceable back to earlier times than those which gave birth to Gothic. In good truth, that for which we claim special nationality has never ceased out of the land. In some districts of Yorkshire and elsewhere, cottages are still erected by the local workmen in the identical style of our forefathers, and the valley of Stroud is full of similar buildings of quite late date. Cottages in the Isle of Thanet down to late in the seventeenth century retained a distinct Mediæval character, and churches are to be found—as that of S. John at Leeds—with very fair Gothic detail, as well as outline and spirit, long after such are commonly supposed to have been extinct.

The Conservative habits of the English Church have kept its services much the same as they were, and though it is often taunted with not bending to the requirements of an altered ritual and different time, yet in reality it has no need for any startling change, and can adapt itself very well to the forms of building to which it clings from long and loved associations.

Hence it is that almost from the commencement of the revival of church building which took place with the beginning of the present century, it cast aside the conventicle type it had adopted, through the influence and genius of Wren, and heartily, if not ably at first, returned to the Gothic style, to which it has remained true and constant to this date.

As far, then, as ecclesiastical architecture is concerned, however theorists may grumble, Gothic must be accepted as its medium for the future. It does not, however, follow that it is always to be confined to copies of what has been done in the past. The style is pliable enough, and with the new materials constantly being developed, and fresh wants, there is ample scope for novelty.

Whether secular architecture will follow in the same route it is somewhat difficult to discern, and certainly not safe to dogmatise about. As regards public buildings, however, a very few years have seen a marked change take place in the same direction. Town after town, even in the very practical Northern counties, are now putting on quite a Mediæval aspect, and if the detail of their buildings be somewhat coarser than might be wished, yet the *ensemble* is striking and picturesque. People are beginning to talk about these works, and to take a lively interest in them, which is much more than could be said a few years since, when cold, if correct, versions of Classic were palmed off upon them. The Town Halls of Liverpool and Leeds find few admirers of their dingy magnificence and darkened interiors. Punch's Stearine order is not in vogue, and visions of towers of Continental aspect are the fashion instead. It is not to be supposed that this is universal, or that secular architecture either is or will be as uniform as ecclesiastical. Some persons always agree to differ from the majority upon principle, to show their own cleverness, and a thing has only to become fashionable to incur their malediction. It is always interesting to notice what such advanced spirits affect. A few years since Norman and Byzantine were their hobbies, and merely as a protest against the general adoption of the pointed arch they belauded the semicircular. Now, however, the buildings of the time of Queen Anne and the Hanoverian dynasty have come in for their turn of enthusiastic admiration. That such, however, should ever become general is inconceivable. The work of these periods has, in fact, no claim to be considered a style of itself; it is but a hybrid of the most corrupt versions of the Renaissance, and to this are now added some incongruous features from the Mediæval—long and narrow windows, barred with preposterously thick sashes in narrow panes, are capped grotesquely by pointed arches, and brick chimneys are, like linked sweetness, long drawn out. We may safely predicate a short, if merry, existence for this freak, and must refuse to accept it for the style for the future. Nor can we look upon the revival of the old timber-constructed dwellings—ably as some experiments in that direction have been recently made—as likely to have any wide-spread or permanent influence on our architecture; in fact, all these attempts have been far too clotely imitative of works of a past but not the best time. Much is to be gained from each, but in principle rather than actual detail. In adopting a style it is as well to take the purest to start from, and then to work out in it the fresh problems of the day, with plain common sense, and not slavish adherence to precedent. In this manner the style of the future will before very long shape out its own natural course.

J. P. S.

SOMERSET ARCHÆOLOGICAL SOCIETY.

(*Concluded from p.* 207.)

The evening meeting was presided over by Mr. W. A. Sanford, F.G.S.

Mr. W. Boyd Dawkins, M.A., F.R.S., gave an exhaustive address, illustrated with charts, on the ancient geography of the West of England.

Mr. E. A. Freeman, D.C.L. (the ex-president of the society), read a masterly treatise upon the history and work of Ine, King of the West Saxons. Four famous spots within the shire, or on its immediate border, claimed Ine as their first founder, or as among the chief of their benefactors, and his works in those spots set him before us as a warrior and a Christian ruler. He raised Taunton as a bulwark against the Briton, and gave the western part of his dominions the first bishop of their own, and placed the holy Ealdhelm in the Church of Sherborne, which he founded. He was the second founder of British Glastonbury and the first founder of English Wells.

On Wednesday the excursions were commenced. A large party travelled in breaks and private conveyances to Hestercombe. Mr. W. A. Jones, one of the hon. secs., pointed out the quarry of syenite granite and its junction with the Devonian strata; and Mr. W. B. Dawkins, F.R.S., explained that this belonged to the crystalline division; the order of rocks which were poured out through active volcanoes. In the house was shown a double-handled battle sword, reputed to have been taken from King John of France by a representative of the Warre family. A paper was read upon the family history by the Rev. T. Hugo. Kingston church having been explored, luncheon was provided in the school-room, and Norton Fitzwarren Church was also inspected. In the latter churchyard there is a burying place for gipsies, and the church has a fine screen. Prebendary Scarth fully described Norton camp, and pointed out its chief features. He specially noted a small depression in a field below the hills, which he believed had been the amphitheatre of the Roman camp, but Mr. G. T. Clark, when appealed to, confessed that he thought it had been a water-tank, or more likely a pond. An animated discussion upon the British and Roman occupation of the hill as a stronghold ensued, Mr. E. A. Freeman, D.C.L., taking part. Bishop's Hull Church and manor were next visited, and Mr. J. H. Parker, C.B., spoke strongly of the wretched state of the former. A portion of the party also visited Trull Church.

More "Wide" Tendering.—The widening of the river Medway, near Maidstone, having been contemplated by the Navigation Company, and plans prepared from the survey of Mr. M. Bulmer, the carrying out of the necessary works was thrown open to competition. The result, says the *Parochial Critic*, is astounding. Of seven tenders from so many firms, the highest (Fuller, £750) was slightly in excess of *four times* the amount of the lowest (Streeton, £187). What is the explanation of such an unparalleled difference?

LEAD ROOF-COVERINGS.*

TO the engineer of to-day, with all the constructive materials for roofing and the varied methods of combining them at his command, it is a curious inquiry how cast-sheet lead ever came to be employed for church and cathedral roofs, whether formed, as in a few instances, nearly flat, or, as mostly, very highly pitched. Like almost all constructive methods, it grew out of antecedent habits and forms partly, and partly came by necessity. The high pitch itself arose much in the same way; it was a form long in use for civil buildings covered with oak shingles, and rapidly shed off snow and rain. The Mediæval churchman and architect found it already imaged and associated in his mind, and saw its advantages as an outer covering for his cathedral, whether that were stone-groined beneath or not, in that it lent itself in form gracefully to the lines and shapes of his Gothic design, and oppressed his side walls with but little lateral thrust. But shingle covering was too perishable and too dangerous, so he had to seek a better. Tiles were too heavy, and otherwise to be objected to; slates were almost unknown, and of the metals, lead alone—the easy manipulation of which had been known for ages—presented itself for adoption. Milled or rolled lead was unknown, that method of producing sheets only dating back to the seventeenth century, while "cast lead," or sheets produced by melted lead flowing over a very slightly inclined table of sand, was known even to Roman plumbers, and so cast sheet lead was employed. The great expansibility of lead by heat and contraction by cold was well known to those observant men who built our cathedrals, and they very soon devised the methods of "laying the lead" which are universally adopted for all such roof coverings to the present hour. The sheets were narrow in proportion to their thickness, laid between "rolls" running up and down the roof, which were protected by "roll caps" also of lead, each sheet or "cap" being only hung as it lay inclined in its place by its upper end, where alone it was fastened, if fastened at all, and not merely held by friction against the wood "rolls" to the timber sheeting beneath, with which the roof framing was wholly covered. So also the lead gutters were laid in "drips," *i.e.*. in short lengths of lead as free to expand and contract as being simply "dressed" into the concave form of the gutter boarding can make them.

No better practice than this of the plumber's art of leading roofs has ever been devised, and it is carefully thus carried out by every well-instructed architect at the present day. Lead, as thus properly laid, is without a particle of solder. Notwithstanding all these precautions, after the lapse of a few years, even in our own comparatively equable climate, the lead covering thus laid becomes more or less "cracked," as the plumber's phrase is. That is to say, the sheets, originally flat and close to the boarding beneath, when examined, are found swelled up every here and there into low rounded ridges of 2in. or 3in. in width, and cracks or fissures are found more or less in the neighbourhood of these as well as in other parts of the lead, sometimes extending for short distances in irregular lines nearly parallel to those swellings, sometimes star-shaped, which let the water through. These must be staunched in some way; and though many methods have been tried, the ordinary and most effectual one is by soldering over these cracks with plumber's solder, and by what the plumber calls a "wiped joint."

Now, what makes the properly-laid lead ever crack at all? Perfectly free as we may leave the marginal extremities of a large sheet of lead, every square foot of its surface is bound down to that of the wood boarding or sheeting beneath it by the frictional adhesion between the wood and the lead due to the weight of the latter. From the great density of lead, the rough surface of the cast sheets, and that of the boarding seldom planed—often uneven—this adhesion is not inconsiderable. Lead, soft at all times, when even very moderately warmed, as by the sun's rays, is so soft that the sheet is unable in expanding to force itself laterally, and in its own plane, over the boarding, opposed as it is by this frictional resistance, and so it rises into the irregular swellings here and there just described. These rise and fall more or less with every change of temperature, and by such continual bending forward and backwards at these swellings, and by the internal strains that give rise to them, the metal is gradually here and there broken through and "cracked." Those who have never had opportunity of realising these facts will derive advantage from reading the extremely interesting paper published some years ago by the late Canon Moseley, F.R.S., on "The Movements of Lead on the Roof of Bristol Cathedral," and which he brought with much ingenuity to illustrate certain movements of glaciers.

Another active cause of the production of "cracks" in lead roofing has, so far as we know, never been noticed. Cast lead is preferred by most architects, on the supposition that it is *sounder—i. e.*, more free from the chance of initial defects than rolled or laminated sheets, and plumbers who happen to possess casting tables have, for trade interests, fostered this delusion. If rolled lead be required by specification to be made from new pig lead of the best quality, without any admixture of old lead, remelted, it is a sounder, and in every respect a better and more durable material—the thickness of sheet being the same—than any cast lead. In the cast lead—from the way in which it is cast and cooled—the crystals of the metal are arranged, in accordance with Mallet's law of crystallisation, with their long axes transverse to the sheet, the planes of weakness due to them are also across the thickness of the sheet, and but a very little of the pulling and pushing by contraction and expansion, accompanied, as these must be, by changes of temperature, are sufficient to cause actual separative crystals. This is the true origin of the stelliform cracks in cast lead; they are found in rolled lead, the crystals of which are parallel to the sheet, so far as they are developed at all, which is always much smaller than in cast lead.

What we have stated—though obliged, by want of space, to omit many not unimportant details—is sufficient to show the mixture of half-knowledge and practical ignorance which appears in a letter from a colonel of Royal Engineers, published in a daily contemporary of the 5th, from which the following is an extract:—

> There is no excuse for the vicious system of patching lead roofs and gutters by soldering defective joints of the lead covering. It is as faulty in principle as dangerous in practice. So long as lead on roofs and gutters is soldered, the expansion and contraction of the metal during changes of temperature will always cause cracks, and this system of repair must necessarily lead to leaky roofs. The proper method of laying or repairing metal roofs and gutters is by allowing the metal free play to expand and contract by means of overlapping joints; and until the cathedral clerks of works learn this fundamental truth they will never get rid of the plumber on the roof with his brazier of charcoal, and the constant danger of fire which follows this reprehensible practice.

The writer does not know—first, that properly-laid lead is *never* soldered at first; secondly, that, however well laid, and as he proposes, its cracking is only a question of time, longer or shorter; thirdly, that when cracking has commenced, there exists no practicable remedy but either to solder up the cracks or to take off the lead and replace it with new, and to do so periodically. Every crack repaired by soldering tends to produce new cracks more rapidly than before, but, nevertheless, soldering up to a certain limit is the best, most sensible, and most economical process. After that limit has been passed, then the wisest plan is to do what the clerk of works of Canterbury Cathedral has stated to be his practice—viz., to remove the most defective sheets, and lay in new lead in their place.

The public mind, then, may set itself at rest as to this fact, that whilever sheet lead in any form, or however laid, continues to be in use for covering buildings, the plumber, and plumber's solder and tools, cannot be always kept off the roofs. Dr. David Price, a gentleman whose extensive knowledge of metallurgic chemistry and general accuracy we need not enlarge upon, has addressed the following suggestion to the *Times* of the 2nd inst.:

> When in applied chemistry we require either to line a wooden evaporating bath with lead, or to build a large chamber with that metal, we do not employ a fiery furnace and pot of molten solder to effect the junction of the sheets, but simply a jet of ignited hydrogen, and a rod of lead. Why do architects not adopt the same plan, and thus lessen the risks of destroying our ancestral mansions and [illegible] the trials when engaged upon the repairs of their leaden roofs?

Here, however, we have the want of practical experience also evinced. What Dr. Price suggests is what every plumber since Roman days has known. He calls it "burning together," and a few years ago—when done by the aid of a coal-gas or hydrogen and air blow-pipe—the process made some noise under the name of "autogenic soldering."

Now, this process is perfectly impracticable for closing up "cracks" in sheets of lead laid on roofs, and if attempted would only make matters worse. When a crack is soldered the sheet around it is scarcely heated at all, plumbers' solder melting at about 400 deg. Fahr., or a little above that. Lead, however, only melts when heated to above 600 deg. Fahr., and its expansion and contraction through so great a range as, say, 550 deg. (from fusion to the atmosphere at 50 deg.) is so great that the autogenic patch would be no sooner made than it would tear out by contraction a new crack in its own neighbourhood. Moreover, upon a steep-pitched roof this process could not be performed at all, and, were it possible, the blow-pipe would have its own dangers not less than those of the fire-pot. Were it not for the method of "wiping," by which the solder-joint is made, even that could not be done when the sheet is highly inclined to the horizon. We must pass over various other more or less useless, not to use a stronger word, proposals by others for making plumbers' work on roofs safe, such as

> Providing the fire-pot with a simple gauze cap, in which it must be placed before taken on to the roof, and with an aperture in the gauze for the insertion of the soldering iron. All we have to do is to adopt the principle of the Davy lamp, and to insist that no fire-pot on any pretence shall be carried without such a gauze guard.

Or another for soldering by the help of an "œlipile," or spirit lamp blow-pipe in place of a fire.

Lead roofs exist. Where they are covering the great majority of our ecclesiastical buildings—there is no use in discussing whether well or ill laid—they will not be abandoned in haste; we must repair them. The plumber has through ages of experience found out the best, we may say the only, methods of repairing them. He must have melted solder—he must have heated irons, and for these he must have a fire sufficiently adjacent to his work. But he need not, and for the future he ought not, to be permitted to have a fire in any shape or in any form of apparatus upon or within the roof of the building. Let it be made upon the ground, as we have suggested, and the simple means provided for rapidlv hoisting up to him the melted solder and his properly protected soldering irons.

In conclusion, we cannot but ask, however, why architects continue in the spirit of slavish tradition, which so much characterises their art, to design lead roofs for new cathedrals or churches, or any other buildings. A plain lead roof, *per se*, has no beauty in it; unless to be wrought as by the artistic plumbers of the sixteenth to the eighteenth centuries into elaborate forms in gables, dormers, &c., it gives a poor skyline, and is bald in form as well as in colour. It is no longer necessary, structurally, anywhere. The perfection as to safety and durability of a building is where, as in the Cathedral of Milan, the roofs are marble, and nothing but marble and glass enters into the general structure of the fabric. When stone cannot be used, other materials may now-a-days be substituted practically as safe and nearly as imperishable. Even for the external covering of domes such as those of S. Peter's—or our S. Paul's—lead is not indispensable. We must, however, reserve the larger treatment of the question of substitution for lead for roof covering to a future opportunity.

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DESTRUCTION OF MONUMENTAL BRASSES.

THE destruction in that interesting class of memorials (says the *Churchman's Shilling Magazine*)—monumental brasses—has always been immense. They have been torn from their slabs for "greedinesse of the brasse" (as Weever puts it) by churchwardens, dishonest workmen, or casual visitors. From the sixteenth to the present century this deplorable spoliation has taken place. Cathedrals like Ely, Hereford, and Lincoln, and such churches as S. Alban's Abbey and Hitchin, exhibit hundreds of brassless slabs—these matrices often showing the beauty of the original brass. A great many brasses perished when the dissolution of religious houses took place. Some were purchased by the engravers of such monuments, and were re-engraved on the other side. These *palimpsest* brasses are very interesting. Mr. Haines devotes several pages of his admirable "Manual of Monumental Brasses" to a consideration of the spoliation of brasses. He quotes the following from the churchwarden's accounts of S. Martin, Leicester, 1547:—"By the commandment of Mr. Mayor and his brethren, according to the King's injunctions in the year of our Lord, 1546, and the first year of the reign of Edward VI., ... four hundred and a quarter of brass was sold for 19s. per cwt. to one man; and 3½cwt. to another at the same price; and 1cwt. to William Taylor." To such an extent was this done in the reign of Elizabeth that the Queen issued a proclamation on the subject. She laments the injury done by wilful persons to ancient monuments, "by which means not only the churches remain at this present day spoiled, broken, and ruinated, to the offence of all noble and gentle hearts, and the extinguishing of the honourable and good memory of sundry virtuous and noble families deceased, but also the true understanding of divers families in this realme is thereby so darkened as the true course of their inheritance may be hereafter interrupted," and threatens severe punishment for the like offence in the future. At Yarmouth, in 1551, the Corporation ordered the brasses to be cast into weights and measures for the use of the town.

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* From the *Engineer*.

In the succeeding century many brasses were cast into cannon during the Civil War, or sold because they were deemed "superstitious." Dowsing, in the years 1643 and 1644, destroyed 192 brasses in fifty-two Suffolk churches. Passing over the eighteenth century, when many brasses perished from mischief or neglect, we come to the present century. Stothard, visiting Lynn in 1813, found that the fine Flemish brass of Robert Attelathe, 1376, had been some years before sold for 5s. to a brass-founder. ("Cotman's Brasses," I., p. 8.) Mr. Haines says it is not many years ago since the effigies of Sir W. Corbet and Lady, 1403, at Marcham, Berks, were sold for 5s. to a builder, and that during the repairs of Warkworth Church, Northants, in 1841, "all the brasses excepting two were thrown away unheeded, and might have been purchased of the workmen for a pot of beer, until Mr. Dandy, the builder, greatly to his credit, buried them for security beneath a large flagstone in the nave of the church, where they still remain." Mr. Charles Faulkner, F.S.A., had in his possession an inscription dated 1497, which, during the "restoration" of Hook Norton Church, Oxon, "was sent by one of the churchwardens (a farmer) to a blacksmith at Bloxham for him to mend his plough with." Mr. Faulkner bought this for 2s., as the blacksmith could not use it for that purpose. Some brasses have been lost by being taken to the house of the incumbent or churchwarden, and being sold or destroyed at their decease.

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SEWAGE IRRIGATION.

A NEW plan of sewage irrigation has been applied at Bishop's Stortford. The contract was taken for £10,000 by Messrs. Lawson & Manser, and ninety acres of land were selected for the purpose. The *Times*, in an elaborate report on what has been done, says that Mr. James Odams, of the Grange, Bishop's Stortford, an active member of the Local Board, has devoted much attention to the whole question of the disposal of town sewage, and, after personal inspection of the working of many different systems, has arranged, in connection with the works just described, a practical exposition of what he believes to be the most economical solution of the sewage problem.

From the simplicity of the apparatus employed, no less than from the novelty of the process and the advantages claimed for it, this experiment should receive the attention of all urban authorities, who are, of necessity, interested in the subject. Taking the sewage as delivered at the outfall, Mr. Odams first separates the solid and floating matters, and then applies the partially-clarified liquid to the surface of land provided for the purpose. Now, there are no capacious subsidence reservoirs in which the black mud may quietly settle to the bottom, and consequently there are no horizontal screws or ascending and descending dredging buckets for clearing out the sludge. There are no extensive and costly filter beds to arrest the particles held in suspension by the sewage percolating through them and requiring renewal after a certain period of use. Neither is any elaborate construction of revolving screens, or, indeed, any machinery whatever, adopted for straining the turbid sewer water. Hence it is quite possible that the ingenious plan found effectual for its purpose at Bishop's Stortford may not be viewed with much favour by sanitary engineers, whose ideas are prone to run upon complicated contrivances, clever mechanism, massive erections, and so on. Economising space and time, the principle followed is to intercept the thick matter in the stream of sewage, not when quiescent, but while it flows; and the merit of the invention lies in the discovery of a screen which allows the liquid to pour rapidly through, yet detains nearly the whole of the suspended particles. Embankers of salt marshes know well enough that a faggot staked upon the surface flooded by the tide will collect in its interstices the slimy mud which is carried in the turbid current, and accommodating to a different use this method of accelerating deposition, the Stortford plan essentially consists in passing the sewage horizontally through a vertical screen or wall of faggots. In one of the small receiving tanks (from which the sewage passes through iron gratings to the pumps), Mr. Odams has placed an upright wall of osier-bunches about 18in. in thickness and extending 5ft. across the current of sewage which flows through it. Perhaps common thorn faggots would have been still better, and the thickness as well as *minimum* surface area of the screen must depend upon the volume and velocity of the current of foul water to be cleared by passing through. At Bishop's Stortford the faggot-screen at 5ft. breadth, and standing some 4ft. into the water, presents a surface area of about 20 square feet; and this is found sufficient for the screening or filtering of filthy sewage, passing through at the rate of about 700 gallons per minute. Large solids, bits of paper, &c., together with a portion of the slime deposited upon the obstructing face of the faggot wall, fall to the bottom of the tank, which for this purpose is made deeper than the lowest part of the screen. The sediment which collects upon the interstitial superficies of the faggot bundles has to be extracted (say) twice a week, in order to preserve, or, rather, continually to renew, their straining capacity; and this clearance is accomplished in the easiest manner imaginable. The faggots being raised out of the tank, there is directed upon them a jet of the clarified sewage issuing under pressure from a flexible tube and hose, when they are washed clean almost instantaneously. The jet, of course, is drawn from the main pipe which conducts the sewage from the pumps up to the farm. Immediately behind the faggot wall is a flat vertical screen of copper wire gauze, of 50 meshes to the lineal inch; so that very fine scum which may find its way through the apertures of the faggots is caught upon its surface. The gauze, stretched upon rectangular frames sliding in grooves, can be withdrawn in sections, for the purpose of being occasionally (perhaps daily) cleansed by a douche, in the same way as with the faggots. This arrangement is the invention of Mr. Isaac Brown, of Edinburgh. While the unscreened sewage has a very offensive odour, the sewage after flowing through the screen is comparatively sweet: it can be applied in irrigation with scarcely any perceptible smell, and as it is so far clarified as to be but very slightly cloudy, it is free from liability to deposit noxious sediment in carriers and gutters, or upon the blades and leaves of plants. It will be observed that the solid matter of the sewage is obtained in mass, without the addition of lime, clay, or any chemical ingredient whatever; so that the weight of sludge to be dealt with is only that originally present in the discharge from the town drains. What this probably amounts to may be estimated from known cases. Thus, 177,000 gallons of sewage per day at Aldershot are reported as yielding from the settling-tanks about 300 tons of solid deposits in the course of a year; and, at this rate, if we take the quantity of sewage at Bishop's Stortford as 25 gallons per head per day, the solid deposits from the 150,000 gallons per day will be 84 tons in a year, or $1\frac{5}{8}$ tons per week. Again, at Croydon, the muddy residuum daily removed by Mr. Baldwin Latham's revolving screens is about one-tenth of a pound per head of the population; so that at Bishop's Stortford, where the separation is finer and more complete, there may be over 600lb. of sludge per day, or (say) two tons per week. Hence, removing this matter ftom the tank and also from the small heaps or receptacles in which the washings of the faggots and screens may be retained cannot require much labour. Cleansing out the tank would probably be done at intervals of a few weeks; and the engineer in charge of the pumping engines might occupy himself in the preparation of the two tons per week of manurial matter for sale. Mr. Odams' proposal is to mix with the sludge (after removal from the tank) an equivalent of dry earth, loam, clay, or whatever soil is readiest to hand, the necessary weight of earth being probably less than that of the sludge In this state he expects that farmers will fetch it away and pay for it, say, 5s., a load. This would be a sufficient price to cover all expense of manipulating the solid part of the sewage. In the case of a town ten times the size of Stortford, that is, with 60,000 inhabitants, there would be, at the above rate, 20 tons per week, or (say) three tons per day, of this waste mud to dispose of, which certainly does not appear a very formidable or costly business.

And now for the utilisation of the screened and clear liquid which carries, in solution, the really valuable constituents of the sewage. The ground requires no levelling or casting up into ridge and furrow, or shaping with uninterrupted gradients, or any other preparation of the surface whatever. Mr. Odams takes the land in hills and hollows just as he finds it; and without delay in contouring or expensive formation of beds, he lays down in parallel lines, 33ft. apart, lead piping of $1\frac{1}{4}$in. bore. Tiny holes (two, three, or four together) are pricked at every $2\frac{1}{2}$ft. along the upper part of the pipe; and the sewage, forced by the steam-pump, issues from the holes like a sparge, spirting up to a height of 10ft. or 15ft., and then falling upon the entire surface of the field in a finely divided or drizzly shower. The arching jets of spray spanning to 20ft. on each side of the pipe not only leave no spot unwetted, but distribute the gentle streams equably over every square yard; the long rows of permanent fountains —playing continuously, intermittently, or as regulated by the turning of a tap-valve—resembling the action of so many enlarged and systematically arranged gardeners' water-cans, as made in the modern style, with long straight perforated nozzles. From the fineness of the wire-gauze strainer through which the liquid has been taken, there is little possibility of the holes becoming choked; the pressure is sufficient for blowing out anything which may accidentally enter a hole from above, and in case of a hole becoming permanently closed up from any cause, it is the simplest thing in the world to pierce another near the same place. By corks or stoppers at the ends of the several lengths of pipe, provision is made for flushing out any sediment which might gradually collect inside. The pressure required is that of a head of water of 25ft. That is, whatever power is expended by the steam-engine in raising the sewage to the level of the field must be increased sufficiently to lift the water 25ft. more, or, in other words, the motive power in all cases is represented by a lift of 25ft. beyond that necessary for surface-flooding. The lead pipe lying just below the surface, with small iron shields protecting it at intervals of two and a half feet where the holes are exposed, scarcely any part of the ground where old pasture land is under treatment can be regarded as occupied to the exclusion of herbage; while, in case of arable culture, tillage operations can be conducted close alongside the pipe; so that a much less proportion of the surface is abstracted from production than by the system of open carriers and gutters. All nuisance is avoided. With the absence of channels or small ditches, there is, of course, the absence of the foul mud which gathers and creates a stench in them; and, contrary to what might be expected, there is no offensive effluvium from the sewage spray, the coarse filth having been removed by the effective screening, while the fine division of the liquid by the jets, bringing it into intimate contact with the atmosphere, probably secures an immediate oxidation of the finer matter. The great advantage claimed for the new system is that, by artificial showers, it applies the fertilising liquid with the utmost economy, as well as in the manner most natural and beneficial both to plants and to the soil. Not a particle is wasted, unless it be by evaporation, which is not considered to be serious in amount. But in the flooding system, the water being its own carrier and flowing upon the surface of the land, must of necessity saturate or overdose the nearer portion of each bed or slope before it can wet the farther side; while it is most difficult, if not impracticable, to give a full dressing to the side of a bed furthest from an open feeder, without a portion of the liquid running over into the waste drain. On the fountain system no loss arises from streams sinking into cracks and fissures flowing away in the subsoil drains. The gentle showers are suitable for all crops, and may be given during any period of time, by night or day, in cloudy weather or in sunshine, as found advisable; and there is neither soaking of the roots and stems of plants nor repletion of portions of the ground with inevitable detriment to its mechanical texture and condition. The crops of grass cut upon the acre of old meadow land now under experiment at Bishop's Stortford certainly tells wonders in favour of this good imitation of natural irrigation. It should not be forgotten that this new system is a mechanical improvement upon the very earliest practice in sewage irrigation; the marvellous products of Canning-park and Myre Hill in Ayrshire, and of Tiptree Farm in Essex, having been obtained from surface applications to the growing plants by manual distribution with pipe and hose. We understand that the entire outlay for the lead piping amounts to somewhat less than 30*l.* per acre. This, indeed, exceeds the general cost of preparing land for ordinary flooding. For though the cost of preparation at Aldershot was 40*l.* to 50*l.* per acre, and that for Merthyr Tydfil is said to have been very much more, the work at Bedford, including the covered earthenware pipes, was executed for 10*l* per acre; and from the experience at Lodge Farm, Barking, at Mr. Hope's Breton Farm, near Romford, and at other places, the average expense of laying out may be considered to be about 15*l.* per acre. But there is this important consideration—the lead remains at all times marketable at about three-fourths of its original value; and, what is a great saving, no manual labour or attention is required to keep the field apparatus in order as with carriers, gutters, drains, stops, hatches, &c., in overflow irrigation.

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A new wing, of two lofty stories, has just been added to Messrs. Charrington & Co's brewery, in the Mile End-road.

We may have to chronicle an unusual item of ecclesiastical building news before long. Canon Trevor states that there is a subscription on foot in Bombay to build a Pagoda in London for the worship of Vishnu and Siva.

THE SCHOOL BOARDS.

Liverpool.—The plans of Messrs. Reade & Goodison, architects, of Canning Chambers, South John-street, for the public elementary schools in connection with the School Board in Chatsworth-street, have been adopted by the Sites and Building Committee of the School Board. The object aimed at in the plan is to meet all the necessary conditions in the simplest possible manner; and in the elevation, while preserving a dignified and substantial appearance, marking the building as a public one, to discard all unnecessary ornament, the effect being dependent, not upon mere prettiness, but upon breadth of treatment. The building will be capable of accommodating 1,000 scholars, and will consist of infants, junior boys, junior girls, senior boys, and senior girls' schools. The two infants' schools are on the ground floor, and while having intercommunication by the common passage, will have separate entrances. The junior and senior girls' schools are to be on the first floor. The junior boys' school will also be on the first floor, and the senior boys' school on the ground floor. The rooms are to be light and lofty, and especial attention is to be directed to their thorough ventilation. The system of warming will be generally by hot-water pipes carried round the rooms, in addition to which it is proposed to have open fireplaces in most of the rooms, both for the purposes of ventilation and cheerfulness and for drying the clothing of children who may have got wet on their way to school. Large playgrounds are to be provided for the boys, girls, and infants, and the plan altogether is most complete in its character. The architects who have been successful for the Queen's-road site are Mr. Thomas Cook, of No. 23, South Castle-street, and Mr. John E. Reeve, of Lord-street Chambers, 87, Lord-street.

London.—Officers for the Architect's Department.—At the last meeting of the London School Board, Mr. Charles Reed, M.P., moved the reception of the report of the Works Committee, that the following officers be appointed for the Architect's Department, subject to one month's notice on either side, and that it be referred back to the Works Committee to make the necessary selection for appointment by the Board:—One chief draughtsman, at £200 per annum; two senior draughtsmen, at £140 each; one senior draughtsman, at £120; four junior draughtsmen, at £80 each; and one writing clerk, at £80.

Thames Embankment Offices.—The London School Board having, says the *Daily Chronicle*, secured a site for its proposed new building on the Thames Embankment, has appointed the following architects to send in designs for the building in competition. The architect whose plans are chosen will be entrusted with the carrying out of the works:—Mr. Waterhouse, of Manchester; London: Sir Digby Wyatt, Mr. Bodley, and Mr. J. Scott.

SCHOOLS OF ART.

Maidstone.—The annual distribution of prizes to the students of the Maidstone School of Art took place on Tuesday week. The school has been established nearly five years, and has during that time given instruction to 121 students, of whom 66, or more than half, have obtained Government prizes. The committee, in presenting their report, regret that the middle and upper classes do not continue to support the effort as they might, by sending their sons and daughters for instruction, but rejoice to say the artisans have shown their appreciation of the great advantages offered by well maintaining their numbers.

Rochdale.—On Saturday night the Mayor of Rochdale distributed the prizes and certificates to the successful candidates of the Rochdale Government Science and Art Classes. The secretary read the report, in which it was stated that the total number of students under instruction, during the past winter session, in science was 119, and in art 69, making a total of 188. The recent examination might be considered satisfactory, as it gave an average of over 70 per cent. of the candidates examined that passed.

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Montreal.—We have received a copy of the Annual Report of Mr. P. MacQuisten, surveyor to the city of Montreal for the year ending February 1, 1872. Our Canadian fellow-subjects appear, like ourselves, to be busy with sanitary work. Thirteen thousand two hundred and thirty-eight lineal feet of brick sewers have been constructed during the year, and 140 shafts with branch sewers. Experiments are being carried out, as here, with various kinds of wooden and asphalte pavements. The total expenses of the road department for the year amount to 258,707·52 dols.

Building Intelligence.

CHURCHES AND CHAPELS.

Brymbo.—The parish church of Brymbo, owing to railway cuttings, became seriously damaged, and it was resolved recently to restore it. The contract of Mr. Roberts, Chester, to build the church for £2,641, was accepted, the design being furnished by Mr. T. H. Wyatt, of London, and the edifice is now completed. Its shape is of a rounded character, and it is without a tower or spire, the highest point being a turret for two bells, 70ft. high. The seats will accommodate 507 persons. The nave in length is 94ft. by 33ft., and the north and south transepts are 25ft. by 15ft., and the chancel 36ft. by 26ft. On the north side of the chancel is situate the vestry, which measures 18ft. by 14ft. The chief entrance for the public is by means of a porch, 14ft. by 11ft. on the south side; and the apex of the roof of the nave is 48ft. high. The stone is from the Moss Quarry, and being somewhat light, has a lively appearance.

Glasgow.—A noteworthy addition to the rich store of stained glass with which the Cathedral is decorated has just been made by the erection of two new windows in Lauder's Crypt. One is to the memory of the late Walter Ferguson, citizen and magistrate of Glasgow, who died in 1846, aged 73, and of Catherine Jeffrey, his wife, who died in 1868, aged 84 years. The subject is "The Ascension." The other is *in memoriam* William M'Call, builder, Glasgow, who died in December last, and of Jessie Meuros, his spouse, who died in 1860; and the subject is taken from II. Kings, chap. 12, which describes how King Jehoash set about "repairing the breaches" of the temple. The appropriateness of such a selection is known to the initiated, and consists in the fact that the late Mr. M'Call was extensively employed on the restoration of the Cathedral under the Board of Works some twenty-five years ago or thereby. The treatment of this peculiar subject is, says the *North British Daily Mail*, singularly happy in point of design; the amount of suggestiveness which it includes, considering the the limited field to work upon—each window, we should state, being but a Gothic head arch—being simply surprising. In point of execution generally these two small windows will at once enhance the repute of the artists, Messrs. W. & J. J. Kier, of St. Peter's-lane, Bothwell-street, whose productions have already given to Glasgow a "local reputation" and a name in this department second to none in the kingdom. We may add that Messrs. Kier have at present in hand a third window, which, ranging with with the two in question, will complete this side of Lauder's Crypt.

Glasgow.—A new United Presbyterian Church, which has just been completed in Albert-street, at the corner of Taylor-street, from designs and under the superintendence of Mr. J. L. Cowan, West Regent-street, was opened for public worship on Sunday, the 8th inst. The church has galleries round three of its sides, and provides accommodation for 750 sitters. The interior has been tastefully and appropriately decorated by Mr. Andrew Wells. A triplet window in the gable to Albert-street has been filled with stained glass by Messrs. Adam & Small; the centre compartment has a medallion head of our Saviour, the vine and wheat having formed the basis of design in the side lights. The building is Early French Gothic in style, and has been erected at a cost of under £3,000, including heating apparatus, &c., complete.

Glasgow.—On Monday the foundation stone of a new Episcopalian Church was laid. The church has been named "S. Ninian's," and will be constructed to contain 420 sittings. It consists of a nave and aisles, with apsidal chancel, and is of the Gothic style of the thirteenth century. The dimensions of the church are 90ft. long by 45ft. in width, exclusive of apse, which projects about 20ft. The door of the church, with a deeply-recessed porch, faces the north. The roof will be formed of dressed timbers. The estimated cost is £3,500. Mr. David Thomson, of S. Vincent-place, Glasgow, is the architect, and the contractors are Mr. James Wallace, Kilmarnock, mason; Mr. John Baxter, wright; Mr. Moses Speirs, plumber; and Messrs. A. & D. M'Kie, slaters.

Margate.—S. Paul's Church has been commenced, under the direction of Mr. R. K. Blessley, architect, Eastbourne, the site being on the Cliftonville Estate, given for that purpose by Mr. T. D. Reeve and Mr. J. Andrews. The contract has been taken by Messrs. Cooke & Green, of London, for the sum of £8,500, inclusive of boundary walls and parsonage. The church will be spacious and lofty, measuring internally 89ft. long by 56ft. wide, and the roof to be carried through a uniform height of 51ft. The chancel, measures 22ft. × 31ft. The nave is to be of six bays, with lofty arcade arches springing from circular columns, with clerestory windows over; arches divide north and south chapels from the chancel, designed for vestry and organ chamber. The church is to be built of brick, faced with random-coursed Kentish rag stone. The dressings to doors and windows will be of Box ground Bath stone. The aisles will be paved with encaustic tiles, as well as the chancel. The reredos, pulpit, and font, will be of Bath stone; the tower will be 80ft. high, and will contain a peal of bells. The style adopted by the architect is Early Decorated, and there will be accommodation provided for 800 people. The roofs are to be open-framed, and stained, as well as the seats, and the whole building is to be heated with hot-water pipes. The clerk of works is Mr. Mark Davison. The foundation stone was laid on September 14, by the Bishop Suffragan of Dover, and it is expected the church will be completed by the middle of September, 1873.

S. David's.—The building committee have met at S. David's to consider what further steps should be taken to restore the Cathedral. The works already finished comprise the tower, from its foundation to its apex; the choir, with its fittings and screen; the eastern arm, with its aisles, complete; the eastern chapel of the south transept; the nave, with its beautiful carved ceiling; and the south aisle of the nave. The committee resolved to repair and make perfectly watertight the roof of the north aisle of the nave, which has not yet been touched. The cost of the completed works and of what was now resolved on, with the architect's commission and the salary of the clerk of the works, was calculated to amount to £25,000, to meet which the committee have received and paid £21,500, leaving a sum of £3,500 to be raised by fresh subscriptions. The repair of the north transept of the Cathedral has been undertaken by one of the canons, at the cost of £1,000. He has promised, if his life should be spared till next year, to repair the roof of the chapter-house also. The repair of the south transept, of the porch, of the west end, and the flooring of the nave with tiles, is for the present postponed, together with the restoration of much of the exterior stone work.

Worcester.—The restoration of Worcester Cathedral is steadily progressing. The interior of the choir and chancel is so far completed as to afford an idea of the general effect. The work is divided into three departments, the flooring of marble and encaustic tiles, which is entrusted to Messrs. Field & Sons, of Westminster, Mr. Godwin, of Lugwardine, Hereford, supplying the encaustic tiles; the metal work screens, which are set up by Messrs. Skidmore, of Coventry; and the woodwork, which is executed by Messrs. Farmer & Brindley, of Lambeth. The wood and metal work are nearly completed; and the flooring, which is a most elaborate and costly work, is rapidly filling up. The design is an elaborate and highly effective one. There are four different kinds of marble used in the work, viz., Greek green, red Devonshire (Barton quarry), dark Barton, and Panderma. The designs are so arranged that encaustic tiles form their centres. The flooring of the chancel is finished. In front of the altar and within the altar railings (not yet erected) is a circle of about 9ft. diameter of concentric rings of different coloured marble and tiles. The screens between the choir and the aisles are of metal work and oak carved work. At the back of the stalls are grilles, which will be coloured when the whole are in place. The metal work extends along the back of the stalls up to the eastward end, whence the screen is of oak up to the chancel. The stalls number twenty-two on one side and twenty-one on the other, and the ancient *misereres* are retained. The screens between this end of the choir and the choir aisles are of carved oak. The Bishop's throne is completed, but is not yet *in situ*. The whole of the work in the choir, it is expected, will be finished in a few weeks, when the present broken flooring of the nave will be removed, and an entirely new floor laid down. It is hoped that this (which will complete the restoration) will be finished by next Easter. The whole of the work is under the immediate superintendence of Mr. Perkins, of Worcester, the resident architect of the Dean and Chapter of Worcester. The designs are by Sir Gilbert Scott.

BUILDINGS.

Anstruther, N.B.—A new Town Hall has just been completed in this busy little town, and was opened for public business on Monday, on the occasion of the Chancellor of the Exchequer's visit to Anstruther. The building is of local freestone, in the old Scotch style, and will cost over £2,000, including site. The architect was Mr. John Harris, S. Andrew's.

NEW CONSERVATIVE CLUB BUILDING.—At a meeting of the members of the Manchester Conservative Club, held the other afternoon, the Building Sub-committee reported that shares to the value of between £60,000 and £70,000 had been subscribed for, and that applications were coming in very fast. On the proposal of the Hon. Algernon F. Egerton, M.P., it was decided to complete the purchase of the site, and to remove to the new building when erected. We understand that the work will now be proceeded with immediately. The site is in Cross-street, opposite the Unitarian Chapel, and extends from Mr. Hall's shop to S. Ann-street, with a depth westerly as far as to Messrs. Lockwood and Marsh's shop in the latter street. The cost of the site is £61,000, and the building is estimated to cost about £30,000 more. A few of the leading Manchester architects are invited to submit designs in a limited competition.

PADDOCK.—On Saturday, the foundation stone was laid of a new boys' school in connection with the church of All Saints, Paddock, Huddersfield. The style is Gothic, and the walls will be faced outside with hammer-dressed wall stones, and inside with pressed bricks. Accommodation is provided for 150 boys as day scholars. The ground floor will contain a school-room 60ft. by 20ft. and 18ft. high, and two class-rooms 16ft. 6in. by 14ft. In the basement there will be a kitchen 20ft. by 14ft. The rooms will be warmed by open fireplaces. The total cost is expected to be about £1,300. The plans have been prepared by Mr. Cocking, architect, of Huddersfield.

WAVERTREE.—The foundation stone of a new Town Hall was laid at Wavertree on Friday last. The general character of the front elevation of the building will be Italian. It will be built of stone from the Cefn quarries, the lower plinths being Runcorn redstone. The entrance porch will be carried up the two stories and finished with a pediment, the cornice being carried across the front and surmounted by a balustrade. The lower part of the porch will be supported on columns having caps of an Ionic character, the upper part being somewhat of the Corinthian type. The whole of the ground floor will be formed of rusticated ashlar, and the upper portion plain polished work. On the ground floor are situated the offices of the board, large board-room, strong-room, &c. The public hall will be placed in the rear, and will be 60ft. long and 34ft. wide, with ceiling of an elliptical form, carried by an ornamented cornice supported by pilasters with ornamental caps. The architect is Mr. John E. Reeve, and Messrs. Okills & Morrison are the contractors.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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☞ American and Belgian Subscribers, *especially when renewing their subscriptions, are particularly requested* to advise the Publisher of the transmission of the Post-office Order, and the exact amount for which it is made payable.

RECEIVED.—T. W. J.—Eat to Live—J. H.—J. R. W.—J. P. S.—M. B. A.—M. & B.—W. H. A.—J. R. B.—J. N.—W. B.—W. O.—S. Bros.—D. & H.—E. W. H.—J. A. C.—B. F.—S. & Sons.

G. H. COX.—Spottiswoode, New-street, E.C.

B. C. HUGHES.—We found we could not accomplish it without unusual expense, and the intention was not realised. The fault was in the drawing. All the others answered well, and were reproduced in regular order. Please, therefore, not blame us.

Correspondence.

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GREEK "AND" GOTHIC.

To the Editor of the BUILDING NEWS.

SIR,—If "Another Protestant and Architect" is "quite familiar with all I have advanced," it is, as Jaques said to Touchstone, "knowledge ill-inhabited." With what *he* has advanced I shall try to make myself familiar by again looking over it. In his latest communication I find that he speaks of the "very perfection" of Greek art being its poverty, but in his letter in your issue of the 2nd of August he says that the Greeks "had the rare merit of giving beauty to a style essentially commonplace;" in one letter he says that Greek sculpture may be the best achievement of human genius, in another that greater things have been done in sculpture than were by the Greeks; in one that the architecture of the Greeks was "only the setting to their sculpture, and without it seems to have a very lifeless beauty;" in another that he is "as great an admirer of the architecture of the High School [and] Royal Institution as any Greek can be"—the High School being a building on which there is no sculpture whatever, and the Royal Institution one on which the sculpture is almost the only blemish. All this may, however, be only another instance of that "variety for which Gothic is conspicuous," although in "constructive genius" the one part does not seem to fit very well with the other. If greater things have been done in sculpture than were by the Greeks, I ask "Another Protestant and Architect" to mention them; if the Goths have produced a greater work than the frieze of the Parthenon, can he tell me its local habitation and its name? He has "a presentiment that the New Zealander of 2,500 A.D. will be found publishing his superlatives on discovering some fragments of a Glasgow statue"—possibly the statue of Sir John Moore, by Flaxman; of James Watt, by Chantery; or one of those in bronze, stone, or marble, for which Glasgow has been indebted to, not the ancient, but the "modern Athens."

In his latest letter, "Another Protestant and Architect" says that "Mr. Hay's theory, like Burke's, goes down before an impartial collection of facts, and is as competent to produce the ugly as the beautiful," and asks "Does Mr. Gildard know that the angular or triangular hypothesis has been actually tried in this City of Edinburgh?" What does he mean by this? So far as this controversy is concerned, I care nothing about Mr. Hay's theory, and I said not a single syllable in support of it. I quoted Mr. Hay's judgment upon the Greek's "works of sculpture, architecture, and ornamental design," and said that on "the subtle curves of the Parthenon" Mr. Hay seemed to be of a different opinion from "Another Protestant and Architect," an opinion in which Mr. Hay was supported by Messrs. Müller, Penrose, Lloyd, and Petit. That an experiment made in Edinburgh by "the angular or triangular hypothesis" "lacks every element of repose peculiar to the Greek" is no proof whatever that in the Parthenon there are not "those invisible curves which have been discovered by accurate measurements, and which are only perceptible from their correction of optical errors."

But, as I said before, with "Another Protestant and Architect" "constructive genius" is the great thing, and "Mr. Gildard reluctantly admits that human genius has done greater things since the age of Pericles in the art of construction and economy of material." Mr. Gildard does not admit, however, that what human genius has done in the art of construction and economy of material is greater than what it has achieved in works of imagination—that the art of construction in an ingenious acrostic by Edgar Allan Poe, and the economy of material in the writing of it in short-hand is by any means equal as a work of genius to some special half-dozen lines by Shakespeare. When we look at the portrait of a Helen or a Cleopatra we do not think of the viscera, the veins, and the vertebratæ; when we look at Ben Lomond under the glory of sunset we do not think of gneiss or grauwicke, or consider too curiously whether igneous or aqueous agency has had most to do with its configuration. Poetry in either nature or art takes little heed of constructive genius or the economy of materials. He was no poet who said of the cathedral that it must have made a mighty hole in some quarry. Undoubtedly, the Greeks did not construct a work like to the Crystal Palace for the Great Exhibition; neither did they construct a Transatlantic telegraph, and "the why is plain as way to parish church"—they knew neither America nor guttapercha. Different wants and supplies have arisen with different circumstances. The art of construction and economy of material are "as full, as perfect, in a hair as heart," and the question is, were the construction and economy practised by the Greeks the best means towards the end that they had purposed, and did they by these means achieve that end? Their special construction and economy gave to their buildings a grandeur and beauty that is not to be seen in those of any other country; and if, besides giving architectural expression, an object of a peculiar construction and economy be to subserve durability, then this object also was effected by the Greeks. Until the latter part of the seventeenth century the Parthenon with all its ornaments existed entire, and it was not time but a bomb-shell that occasioned its destruction.

According to "Another Protestant and Architect," "if architecture of equal or surpassing beauty is produced with infinitely more of skill in the construction and adaptation of material, we have a higher style of architecture and a 'greater achievement of human genius,'" and on this admission he "builds without fear of contradiction a claim for the supremacy of Gothic, take it all in all." But then I do not admit it. Will "Another Protestant and Architect" just mention the Gothic building that is of equal or surpassing beauty to the Parthenon? Will he instance one of the host of Gothic churches or cathedrals—those things of comparatively yesterday—that he would submit to a criticism such as that which for centuries has been bestowed upon the great Greek temple? Will he explain why it is that, in "Retrospective Europe," Mr. Petit says of the Parthenon, "I never felt so powerfully impressed with a sense of the sublime by any work of art," and that from go-a-head America Mr. Stephens wrote "the noblest monument of architectural genius which the world ever saw"? Will he mention the Gothic building of which as much can be said by even himself? He has abundance to choose from—Gothic buildings are numerous, large, and, of course, "varied." I have in this controversy cited well-known buildings, and given the opinions of well-known men, and all this is met by no more than the assertions and opinions of one who, for aught your readers know, may be a third or fourth years' apprentice in a third or fourth-rate architect's office. That is, unless he be Bartholomew, for "Another Protestant and Architect" "backs Bartholomew against Gildard, and Bartholomew's disciple Ruskin against Samuel Johnson." In the meantime no other can in fairness be "backed" against Gildard than "Another Protestant and Architect:" and to talk of backing Ruskin against Samuel Johnson is simply to talk nonsense. Ruskin is an eloquent art critic, and Dr. Johnson, although the intimate friend of Reynolds, knew but little about art. I quoted Dr. Johnson's argument from antiquity, and I think that just now in this "Greek *and* Gothic" all that we have to do with Dr. Johnson is to see whether his argument is, or is not, repugnant to reason.

"As to the proportions of the Parthenon, it is but one of many existing remains, no two of which agree in their design; some specimens of Doric I am sure Mr. Gildard would pronounce clumsy . . . No two of many existing remains agree in their design," and again, "Alas for human genius, if it is to be cribb'd, cabin'd, and confin'd by such a model as the Doric of the Parthenon"!

Cabin'd, cribb'd, confin'd, bound in?

Nay, rather, Greek art in architecture is to those who see beyond its letter to its spirit, to those who do not copy because they can create, while—

Whole as the marble, founded as the rock,
As broad and general as the casing air.

That some specimens of Doric are clumsy is just possible, yet even "dull Bœotia gave a Pindar birth," and I do not suppose that with that "variety for which Gothic is conspicuous," it will be affirmed that all Gothic works are of equal excellence. And the Doric having been disposed of by "Another Protestant and Architect," and, doubtless, to his satisfaction, he now deals with the Ionic—"an unfluted Ionic pillar is the most graceless form conceivable." Then, why not flute it? Why not look at the columns of the Erectheon and the Minerva-Pollio? And "the want of 'bell' in the Ionic capital; or, rather, its lack of depth, is abhorrent to the eye." But then there is "variety," for the faces and ends are unlike, and there may be beauty also, although it is not likely to be recognised by those who "seeing shall see, and not perceive." There is, perhaps, a form, as well as a colour, blindness.

The extraordinary statement "Even Mr. Thomson [of Glasgow, I suppose] goes back for inspiration to the Egyptian" I simply deny, and throw upon "Another Protestant and Architect" the onus of proving what he says.

In concluding his letter, "Another Protestant and Architect" rises to the language of prophecy—"The

Gothic and the Classic[*] arch will win and keep the field." He has had his prophetic look. I will, if he will allow me, turn round the telescope and have a look the other way—at history.

> "There is a history, * *
> The which observed, a man may prophecy,
> With a near aim of the main chance of things
> As yet not come to life."

I see by looking at history that when the Gothic arch had aforetime possession of the field, it did not "keep" it. I see that Gothic architecture had advantages then which it has not now; that it was then the almost universal architecture of not only Scotland and England, but of also great countries on the Continent; that it was employed in works of much material bulk and of singular significance; that it enjoyed the peculiar stimulus of religious enthusiasm; that its patrons, if not professors, were of an all-powerful and wide-spread hierarchy; and that notwithstanding these most favourable circumstances towards the "keeping" of the field, instead of advancing it declined, and ultimately "died out" in a phase that even its most zealous apologists would be ashamed to "revive." When aforetime it "won" the field, it was when the bulk of the nation was in ignorance and superstition; when learning, instead of being sown broadcast, was cultivated in patches in court-yards and cloisters, and when the tree of knowledge might, as regards the people, have been in the Garden of Hesperides and guarded by dragons. But did it "keep" it when England took its greatest step in the march of civilisation—the reign of the great Elizabeth? Did it keep it alongside of the Reformation and the printing-press, the drama of Shakespeare and the philosophy of Bacon? Where was it when Milton and Dryden, Pope and Addison, or Johnson and Goldsmith, wrote; when Newton and Locke speculated and demonstrated; when Vandyke and Rubens, or Reynolds and Gainsborough, painted; when Flaxman and Chantery transmuted marble and metal into sculpture; when Pitt and Fox, or Burke and Sheridan, legislated or declaimed; or when Garrick, Kemble, Siddons, or Kean held possession of the stage? In looking at history through the telescope there are seen many constellations of such fixed stars of the first magnitude and brilliance; if the Gothic arch be visible, it is as a comet returning upon an horizon black with the smoke of the steam-engine from a zenith dark with ignorance and superstition. Although the Gothic arch could not "keep the field" when it was buttressed by the most favouring circumstances; although, so to speak, it "paled its ineffectual fire" when art and literature pre-eminently shone, "Another Protestant and Architect" has seen in this latter half of the nineteenth century, in "the very age and body of the time," some new basis on which to rear his confident prediction. The age is pre-eminently prosaic—a cast-iron age of "the art of construction and economy of material." Universality and mere utilitarianism are among its chief characteristics—utilitarianism that has made us not fire but steam worshippers, and universality that if it has spread the concrete more widely has of necessity lowered it.

I look upon Christianity as independent of architecture as a fine art, as independent of Greek as of Gothic; yet if (much virtue in this "if," remember) any consideration is to be given to the plea sometimes urged that to the Church ought to be given nothing less than the best achievements of human genius, then I argue for Greek—the style that for more than two thousand years has alike courted and withstood the criticism of the civilised world.—I am, &c., THOMAS GILDARD.

Glasgow, September 16.

KINGSTON-UPON-HULL COMPETITION.

SIR,—I send you a letter received this morning from the clerk to the Local Board of Health. If you have space next week it may be as well to let the profession know what this Board intend doing.—I am, &c.,

Bath, Sept. 14. WILLIAM JNO. WILLSON.

[*Copy.*]

Local Board of Health, Kingston-upon-Hull,
September 13.

DEAR SIR,—In reply to your letter of the 11th instant, received this morning, I am of opinion that the successful architect will not be engaged to carry out the design for the cemetery chapels, &c., but of this I cannot speak positively.—I am, dear sir, yours truly, C. S. TODD, clerk.

Messrs. Willson & Co., 1, Belmont, Bath.

LEICESTER.

SIR,—In your impression of the 14th inst. there appears a letter, signed "H.," referring to the architecture of Leicester. From the tone of your correspondent's remarks, I am led to conclude that he is not a native or even a resident in that place.

Leicester formerly was a city, and possessed a cathedral, which stood on the site now occupied by S. Margaret's Church. If by the term Mother Church "H." means the oldest in existence, he is wrong in ascribing that title to S. Martin's (the one which has had a tower and spire designed by Mr. Brandon, erected in lieu of the old one, which was much decayed), as S. Nicholas Church, situate near the Jewry Wall in the old Roman portion of the town is much the oldest, and, if I mistake not, has some specimens of Saxon work in the tower; and both S. Mary's, near the Castle, and All Saints', have (or had) some examples of Norman work in them, whilst S. Martin's is almost all Pointed. Besides these, there were others which had fallen into decay, and were taken down early in the last century. There are still some Mediæval buildings existing in the shape of almshouses and old houses with their projecting stories, though some—such as the Old Blue Boar—have been improved off the face of the earth. With reference to new churches: Trinity Church, which "H." says is not yet completed—a Trinity Church in exactly the same locality he describes was erected about 1838 from designs by Sir Sidney Smirke, but being very plain in elevation was externally remodelled about twenty years ago, so I suppose the remarks apply to some alteration or addition now being carried out.

I may also be allowed to question the good taste evinced in introducing names of some of the local architects into his letter, when, according to "H.'s" opinion, the works of all seem to belong to the same category; and I think that if he had taken a more than casual glance as he walked along the streets, he would, perhaps, have found as much to admire as to condemn.—I am, &c.,

AN OLD LEICESTERIAN.

WANTED, A SURVEYOR!

"SUDBURY PAVING AND LIGHTING COMMISSIONERS.—Wanted a Surveyor and Collector of Highway and Paving Rates.—On Monday, the 23rd day of September instant, the above Commissioners will proceed to the election of a Rate Collector and Surveyor of Roads. He will be required to prepare the receipts for and collect the Paving and Lighting Rates, and to superintend the keeping in proper repair and condition the Highways, Pavements, and Footpaths of the Borough of Sudbury, in the County of Suffolk. Stipend £50 per annum, to be paid quarterly. Applications with Testimonials must be sent to the Clerk on or before 10 o'clock a.m., on Monday, the 23rd day of September inst. The person appointed will be required to enter into a Bond of £150 and two sureties of £150 each, for the due performance of his duties. By order, Henry C. Canham, Clerk. Sudbury, Suffolk, 9th Sept., 1872."

SIR,—The above is cut from the columns of the *Suffolk and Essex Free Press.* There are about 26 miles of road to survey, and four rates to collect during the year.—I am, &c., A REGULAR SUBSCRIBER.

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COST TO THE MASONS OF THE LOCK-OUT AND STRIKE.—It appears from their balance-sheet that the three weeks' lock out and strike cost the masons close upon £830. A sum of £521 2s., being 2s. a day from 1 to 17 days, was disbursed for "dispute pay" amongst 428 members of the Operative Stone Masons' Society of England and Wales. most, if not all, of whom were also included in the 439 members who shared in three dividends, amounting in the aggregate to £151 5s. 6d. obtained from levies and subscriptions; and 191 non-members received £52 1s. 6d. from the same source. After the settlement with the employers on July 5th, 12 members and 9 non-members were "withdrawn" from work to enforce the new terms, the former receiving £6, and the latter £8 13s. 4d. from levies, or 2s. 8d. a day, the time ranging from 1 to 18 days. The charge for collection and distribution was £89 19s 7½d.—viz., executive, £13 1s.; deputation, £16 5s. 11d.; printing and stationery, £16 15s. 9d.; postage and telegrams, £3 1s. 6d.; hire of rooms, £2 7s.; newspapers, 13s. 11d.; and auditors, £7 11s. 6d. The receipts comprised £537 5s. 3d. from the Central Committee of the Society; £112 19s. from levies of 3s. per week upon men working in the London district; £34 4s. from a sixpenny levy; and £162 17s. 7½d. from general subscriptions; making a total of £847 5s. 10½d. The number of men locked out and on strike embraced in the account was a little over 550. There are from 18,000 to 20,000 members enrolled in the Society throughout England and Wales, and the masons are probably the best organised of all the branches of the building trade in London.

Intercommunication.

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QUESTIONS.

[2656.]—**Puzzolana.**—Will "J. T. J.," who kindly answered this query (2643) in your last number, be good enough to favour us with some more explicit directions? What are the processes of manufacturing puzzolana from powdered brick and tile dust, and from burnt clay?—M.

[2657.]—**Heating Mill by Steam.**—Could any reader inform me of an efficient and practicable method of heating a mill by steam? I am at present engaged with large additions to a paper-mill. Open flues in such structures are so dangerous that I have resolved to discard them altogether, and, if possible, heat the various apartments by waste steam from two large boilers in the mill. I should feel obliged for several practical answers on the subject.—ESPARTO.

REPLIES.

[2653.]—**Clerk.**—The term "good quantity surveyor and estimating clerk" indicates a person with a thorough knowledge of *all* trades connected with building. A learner, above all things, should inspect buildings in course of construction and erection, from start to finish. Act accordingly. The power of estimating accurately can only be acquired by years' experience in a contractor's office, and involves an intimate acquaintance with the fluctuations of the markets at all times.—F.

[2653.]—**Clerk.**—Having gone through the ordeal of "working at the bench," I am, perhaps, in a position to offer a word or two in reply to the query put by "Pater." Although as yet but a young man, I have found the information there gained invaluable. Of course, to go from boarding school into a joiner's shop was not altogether a pleasant change, nor was it the popular way of becoming a member of the polite profession of architecture, yet this was my ambition then as it is now. The builder to whom we went (an ecclesiastical man) even explained that the two businesses were entirely different—in one sense of course they are, but practical knowledge is as much required by the one as the other. After being two years in and out of the shops, yards, and buildings, I was articled in the ordinary way to an architect. Upon the expiration of my articles, like most architectural students, I made a rush to London, in order to edge myself into an office there. This was managed at last, but not, let me add, from the fact of having worked at the bench. The water-colour sketches under my arm supplied the key. To present oneself to an art architect as a pupil originally from such a school as a builder's shop would never do. I do not, however, say that art architects are not practical, but they have a righteous antipathy to an architect of builder's creation, and for that matter so have I. To "Pater" I would say it is decidedly not necessary for any one who is anxious to be either architect or quantity surveyor to go to the bench, else where would almost all those be who now flourish in these professions? But, on the other hand, it is equally certain that he who has done so with his ultimate calling in view always stands at an advantage. Matters are then learnt which cannot be acquired afterwards or elsewhere. My advice, therefore, to "Pater" is, place your son in a good builder's shop for twelve months or so, providing he be young enough to allow of three years' pupilage with a quantity surveyor afterwards; and, in conclusion, let the student remember the old adage, "Heaven helps those who help themselves." Work well applied is the only golden rule to success in anything.—A YOUNG ARCHITECT.

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HOSPITAL CONSTRUCTION.—A paper was read on Monday, by Mr. H. Greenway, M.R.C.S., before the Health Section of the Social Science Congress, on "A New Mode of Hospital Construction." He maintained that, as the walls of hospitals frequently became the means of perpetuating infection, through having absorbed particles of disease, germs originally harmless, but which afterwards underwent a change in their nature and effect, the wounds of patients were also affected by these same particles floating about. The remedy suggested for this was to do away with large palatial hospitals, and to place each patient in a separate wooden hut, to be used only for a few years. This would, however, be impracticable for large cities, where space was a desideratum, and the general administration would be difficult. The reader's device was to erect buildings of any length, but of only two stories high, to be so divided that each patient would have the enjoyment of his own supply of atmospheric air uncontaminated by exhalation from his neighbour, the supply of air to be constantly renewed, and the compartments being made of glass, no absorption of morbid product or of emanations which might eventually become injurious could take place, and by washing them with water they would ever retain their purity. Heat was also proposed to be conveyed by heated paraffin oil being circulated through small pipes, instead of by water. The chairman expressed his agreement with Mr. Greenway in the belief that glass would revent absorption.

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[*] The Classic arch is neither Greek nor Gothic and may have just enough ado with its own business without intermeddling in that of others.

Our Office Table.

Safety of Royal Residences.—Some opposition having been raised to the establishment at Esher of the manufactory of the Patent Cotton Gunpowder Company (Limited), the attention of Mr. Gore, the Commissioner of Woods having charge of the Crown property in Surrey, was called to an application by the company to the magistrates of Kingston for a license for the establishment of such a factory, and for the making and storing powder or gun-cotton there. He wrote to Messrs. Tilleard, Godden, & Holme on the subject, and they replied that the application for a license has been withdrawn, the attention of the directors having been called to the proximity of Claremont, and the restriction contained in the Act of Parliament as to royal residences, within two miles of which no such place must be established.

Asphalte in South London.—Asphalte does not appear to be answering as a road material in the southern districts of the metropolis. The *Metropolitan* directs the attention of the Vestry of Camberwell to the present condition of the High-street, Peckham, more especially to that portion of it which was asphalted at the time the tramway was laid down last year. The inhabitants of High-street were very anxious for the asphalte at that time; but could they have anticipated its present condition the *Metropolitan* has no doubt they would have preferred any other kind of paving. Whether owing to the description of asphalte, defective laying down of the concrete bed, or the softness of the ground beneath it, the roadway is now in a most disgraceful state of dilapidation. There is scarcely a yard of it which is not disfigured by unseemly ruts and holes, and the marks of cart-wheels and horse-shoes.

Royal Gallery of Illustration.—We are glad to hear that the Gallery opens for the season on Tuesday, October 1st, after a recess of six weeks, during which Mrs. Reed and her talented company have been resting from their labours. So large were the audiences in August last, and so many have been the requests that the last Entertainment should be continued, that it has been determined to prolong for a short time the career of "My Aunt's Secret," Mr. Corney Grain's Song, and "Charity Begins at Home." Various novelties will then be brought forward: there will be a New Entertainment by W. S. Gilbert, entitled "Happy Arcadia," music by Frederick Clay; a new Musical Sketch, by Mr. Corney Grain, and a novelty from the pen of F. C. Burnand, the music to which will be by James L. Molloy. Under such arrangements, the success of the forthcoming season is fully assured.

London Gas Supply.—On Tuesday evening Mr. G. Flintoff, C.E., delivered a second lecture upon the quality and price of gas in the metropolis, at Exeter Hall, Mr. J. Ottley in the chair. Giving first a history of the principal metropolitan gas companies, he proceeded to argue that the present generation were paying an unnecessarily high interest upon the immense capital invested in gas plant in the first instance. The quality, which was one of the most important points for the consumer, was admittedly bad in the metropolis, because if it were improved the profits of the companies would be for a time decreased, as 2,000ft. of 18-candle gas would burn as long and give as much light as 3,000ft. of 12-candle gas. It was resolved that the Metropolitan and City of London Gas Acts were measures calculated to perpetuate the monopoly in the trade of gas-making, and were a burdensome tax upon the community; that the supply of gas should be vested in the local authorities, as it was in the principal towns, and that a Bill be applied for in Parliament for that purpose.

A Constant Supply of Water.—A correspondent of the *Times* calls attention to one of the difficulties attending a constant supply of water. He says:—Nothing but an empty pipe can insure security against fracture and leakage. Hitherto we have been greatly protected from the influence of frost by the system of turning off the water, periodically, because when the water is regularly turned off the pipes as regularly empty themselves. But, if they are to be always charged, it will be necessary that every householder should be provided with the means for shutting off the supply and emptying his pipes. And this must be done with the greatest regularity in the winter time when there is any chance of frost, for if caught napping by a severe frost with the pipes charged with water, a fracture and an inundation must be the inevitable result. I am not aware whether the new regulation comes into operation in the ensuing winter, if so, no time should now be lost in making provision for so unprecedented a state of things.

CHIPS.

New Schools are about to be erected at Minestead, Hants, to accommodate 240 children, by Mr. F. Streater, of Romsey.

The Church of the Holy Trinity, Dunoon, N.B., has lately been having some additions made to its internal decorations, the most recent being six stained glass windows, which have been introduced into the walls of the chancel. The windows are the workmanship of Messrs. Mayer & Co., of London and Munich.

The parish church of Snave, Kent, is about to be restored, from designs by Mr. C. T. Whitley, of Dover, by Messrs. Harnett, of Whitstable.

The Marquis of Bute has engaged Mr. Burges to design decorations for the cabin of the steamer Glamorgan, launched the other day at Renfrew, and intended to sail between Cardiff and New York. It is not often, remarks the *Athenæum*, that we hear of a leading architect being employed on such work, and it is odd to find the same artist engaged in such a task and in decorating S. Paul's. As Mr. Burges understands the theory and principles of decoration, and possesses great fertility of resource, no one, except those who cannot shake off the trammels of convention and red tape, doubts his success in both cases.

In removing the earth for the foundations of the new buildings in Queen Victoria-street, the bed of the old Wall-brook has been reached, with a margin of Roman pavement in good preservation, and about a basketful of human bones have been picked up in the alluvial soil.

On Sunday week the new (Roman) Catholic Church of the Sacred Heart and S. Brigid, Kilcullen, was consecrated by the Cardinal Archbishop of Dublin. The new church is from the designs of Mr. McCarthy, of Dublin.

The Bishop of Dover on Saturday last laid the foundation stone of a new church at Cliftonville, Margate, dedicated to S. Paul. The church will be built of Kentish rag, with Caen stone dressing; Mr. W. R. K. Blessley, of Eastbourne, is the architect, and Messrs. Cook & Green of London, the builders.

A new clock and chimes were formally started in the parish church of Sittingbourne on Tuesday week. Messrs. Gillett & Bland, of Croydon, are the makers.

The first sod of the Jersey Eastern Railway was cut on Monday, near S. Helier's. The line is designed to form part of a chain of railways right round the island, and more immediately to connect S. Helier's with Gorey, and so, by steamer, with the coast of France and the French system of lines.

The Midland Railway Hotel, at S. Pancras, has already cost £122,000, and from £80,000 to £100,000 more will be required if Sir G. Gilbert Scott's design is carried out in its integrity.

The price of gas in Manchester has been raised by twopence per thousand cubic feet.

It is stated as a curious fact, on the authority of the *Edinburgh Medical Journal*, that during the strike of the scavengers in Edinburgh the mortality of that city fell to 15 per 1,000. This is a nut for vital statisticians to crack.

The bridge across the Shrewsbury river, connecting the Sandy Hook beach with the Highlands to the Neversink, N.J., was commenced on the 19th ult. The bridge will be about 300ft. long, with a swing draw, having openings 80ft. wide for the passage of vessels.

The Sanitary and Economic Manure Company, of S. Ann's-square, Manchester, exhibited their closet arrangements at the Manchester and Liverpool Agricultural Society's Show at Bolton, and were awarded the Society's Silver Medal for the sanitary and economic advantages of their system.

The foundation stone of the Watt Institution, or New School of Art, Chambers-street, Edinburgh, will be laid on 8th October next by the Earl of Roslyn.

Under the late Act 35 and 36 Victoria, cap. 95, the Commissioners of Epping Forest are empowered to suspend legal proceedings until Parliament shall be enabled to legislate upon the report to be made by them, except in the matters mentioned in the statute.

The carriage-way of Lothbury is being paved with Barnett's asphalte.

Sir Sydney H. Waterlow, well known in connection with the Improved Industrial Dwellings Company, will in all probability be Lord Mayor of London next year.

The Corporation of London, having determined to commemorate Thanksgiving Day by striking a medal, advertised through the Royal Reception Committee, for designs and tenders, and Messrs. Wyon, the eminent medalists, have obtained the contract.

Sir Digby Wyatt, Mr. Waterhouse, Mr. Bodley, & Mr. J. Scott, are the architects invited to send in designs for the new building for the London School Board on the Thames Embankment.

Mr. Charles Henry Driver, C.E., F.R.I.B.A., the architect of the Crystal Palace Aquarium, has been selected by the Commissioners of the Vienna Exhibition to prepare designs for the erection of a permanent aquarium of considerable magnitude in that city.

NEW PATENTS CONNECTED WITH BUILDING AND BUILDING TRADES.

542. P. H. H. Nickson, Newton-on-the-Hill, Salop, "Lining for fireproof safes."—Dated 20th February, 1872.

The inventor proposes, instead of any chemical or other compositions, to use as a lining, sheets of mica, which is a well known finely foliated mineral of a pearly metallic lustre, and is flexible and elastic. It is now used instead of glass to enclose the fire without concealing the flame in certain stoves, and when used according to the invention as a lining for safes will effectually prevent destruction of the same by fire. The sheets of mica employed may be, of course, of any required thickness, and should be so arranged as to carefully dovetail the one into the other when the safe is closed, so that there may be a complete junction of the mica lining.

543. W. F. Hudson, London, "Releasing spring and other roller blinds."—Dated 20th February, 1872.

This invention consists of a wedge acting against the roller or flanges attached thereto so as to stop the blind directly the wedge is brought in contact therewith, and so that the roller will revolve freely so long as the wedge is not touching it, but directly the wedge comes in contact with the roller it causes it to stop. The invention is intended to be applied to common roller blinds, and also to spring roller blinds. The wedge used for such different classes of blinds is not similar in shape or form, but the action and effect is the same in both cases. The invention is the application of the wedge by pressure between a stationary and a revolving substance, the effect of which when applied is to stop the roller; and this is claimed in whatever shape, form, or material it may be made. A novel and important feature resulting from this invention is, that the working of the blind is noiseless. Another very important improvement consequent upon the said invention is that the action is inside the roller, thereby allowing the cloth of the blind to be brought within a quarter of an inch of the bracket. Both of these improvements the inventor claims.

558. A. Laurie, Glasgow, "Skylights."—Dated 21st February, 1872.

The movable frame is cast with two pins or journals at its two upper corners, and bearings are provided for these journals on the fixed frame. Two bearing caps are cast separately, and when the fixed frame is being cast one of these caps is set in its place in the mould, and having pins projecting down, is fixed by the casting operation. Afterwards one of the journals of the movable frame is easily entered into the bearing with the fixed cap, and then the loose cap is put over the other journal and secured by screws. In casting the movable frame a broad staple or holdfast is set in the mould so as to be fixed on the underside of the frame, and the sword for holding the frame in a closed or more or less open position is afterwards jointed on the staple.

566. W. H. Le Mesurier, Birkenhead, Cheshire, "Roofing buildings."—Dated 22nd February, 1872.

The features of novelty of this invention consist in roofing buildings in the following manner:—The inventor takes roofing spars of about 3in. wide, and forms a rebate on two opposite sides thereof to receive the slates, which may be bedded in mortar, cement, or putty, and to the upper and centre portion of the spar he affixes a capping piece by screws or nails, and the space between this capping piece and the top of the slates he makes good with mortar, cement, or other suitable weather-proof material, and, if necessary, covers the said capping piece with zinc or galvanised iron. He also forms a longitudinal saw cut extending from spouting to ridge in the right and left sides of the said spars throughout their entire length in a sloping direction to receive a portion of one side of a piece of zinc, galvanised iron, or other suitable material made in the form of a gutter, but when the spar is in one piece only throughout the length of the roof. In such case he makes the before mentioned saw cuts or sloping channels serve as gutters, the saw cuts in this case sloping downwards at each side of the spar, whereas in the former case they are sloped upwards to receive and hold the gutters by one edge; and he would here remark that this application of gutters or channels at each roofing spar, to receive any leakage that may occur, forms an important feature of novelty in this invention.

569. W. E. Rendle, Westminster, "Greenhouses, &c."—Dated 22nd February, 1872.

This provisional specification describes employing double glazing for the roof and sides of greenhouses and such like structures, and heating apparatus is provided for heating the space between the two glazings. One of the glazings is made so that it may be easily removed. An arrangement of watering by means of a perforated pipe is also described.

586. A. Moore, London, and A. C. Moore, Liverpool, "Roll caps for sheet metal roofing."—Dated 23rd February, 1872.

One part of this invention consists in forming the stop end of sheet metal roll caps from out of the metal of the roll cap itself, instead of forming such stop end of a separate piece, soldered on to the roll cap, as has been done heretofore. Another part of this invention consists in forming the "saddle piece" of the roll cap, which lies against the side of the ridge of the roof, from out of the solid metal of the roll cap itself, without the use of any solder whatever, instead of soldering such saddle piece to the end of the roll cap as heretofore.

Trade News.

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WAGES MOVEMENT.

London.—On Tuesday morning, about 500 building operatives, comprising carpenters, masons, bricklayers, plasterers, painters, and labourers, ceased working for Messrs. Corbett and M'Clymont, of West Brompton. After the agreement for the 52½ hours at 8½d. per hour had been entered into with the associated masters and the men's deputation, Messrs. Corbett and M'Clymont were asked to agree to the same terms, which they did, and paid them for one week. At the end of that time, however, they intimated that they would only pay 8d. per hour, and allow the men to work as long as they liked. A prominent member of the Master Builders' Association having been seen at the office of Corbett and M'Clymont shortly before the posting of the notice which led to the strike has had the effect of arousing a suspicion amongst the leaders of the operatives that the step was taken at the instigation of that body. Having conceded one week and withdrawn the next the 52½ hours at 8½d. the hour is pronounced to be the "test" to some future adverse action of the employers, or the beginning of a reactionary movement to prevent other "outside" firms from coming into the new regulations. At a meeting on Wednesday night of the house-painters and decorators' delegation the subject was pointedly referred to by the chairman, who did not hesitate to predict that unless the various trades speedily abandoned the petty jealousies that kept them asunder, the advantages just obtained would gradually be filched away from them. It was intended, he said, that he and the secretary of the carpenters, accompanied by representatives of the men on strike, should wait upon Mr. M'Clymont to put the question pointedly to the firm, "Is the fight in earnest?" because if it was, immediate action must be taken to counteract this unexpected retrograde movement on the part of the employers. Mr. Thorpe, who attended as a deputation from the firm, thought these fears would soon be dissipated, as, from what he had heard that afternoon in a reliable quarter, the firm, before the week was out, would withdraw their notice, and the men return to work under the new regulations of 52½ hours and 8½d. the hour. Many of the men in most of the departments had already been taken on by full-priced firms, and he was not without hope the firm would retrace their ill-advised steps in a very short time. Despite, however, this re-assuring announcement, the delegates proceeded to pass three resolutions, viz:—1. "That the painters of London be at once called upon to improve their organisation so as to able to enforce the terms of their original memorial, sent into the employers, at the earliest opportunity." 2. "That district meetings be forthwith organised throughout the metropolis, with a view to bring into one union the local societies already existing, as well as non-society men." 3. "That the men on strike at Corbett and M'Clymont's be paid at the rate of 15s. per week." Mr. Thorpe added to his previous statement that none of the men who had come out were likely to go in again except under the agreement with the Masters' Association. Similar statements were made to the executives of some of the other branches, including the masons, bricklayers, and plasterers.

Motherwell.—The masons employed in the erection of the new Established Church in Merry-street, Motherwell, have come out on strike for an advance of ½d. per hour.

Reading.—The whole of the bricklayers in Reading were on strike all last week, and the carpenters have gone out on strike this week. Two London delegates have been agitating the bricklayers during the past few weeks, and meetings have been held among the operatives, at which they determined to demand 6½ per hour, and 56 hours to constitute a working week, the men to leave work on Saturdays at one. One or two of the masters were inclined to concede the demands of the men, but subsequently withdrew the concession to act uniformly with the other masters. The carpenters are agitating for 7d. an hour and 54½ hours to constitute a working week. The present hours of work for carpenters are 56 hours per week.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney pieces, Stove Ranges, Rain water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to range with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

Glynleigh.—For the erection of mansion, &c., for Mr. W. Taylor, Glynleigh, Sussex. Messrs. Bailey Denton, Son, & North, architects. Quantities by Messrs. W. Barnet & G. Stanham:—

	Mansion.	Two gate lodges, and two cottages.	Stables and clock-tower.
	£	£	£
Chappell	[illegible]	3893	[illegible]
Trollope & Sons	12926	5627	[illegible]
Myers & Sons	12552	5649	4797
Bass	12713	[illegible]	[illegible]

London.—For erecting paper warehouse in S. Bride-street, E.C. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett.—

Elkington (accepted)	£2509

Middlesex.—For the enlargement of a mansion at Totteridge, Middlesex, for Mrs. Shuttleworth. Quantities supplied:—

Scrivener & White	£1720
Woodhall	1400
Thomas	1288
Gilmour (accepted)	1260

Sheen.—For the erection of a house for the Hon. S. R. Curzon. Mr. J. Peacock, architect:—

Lathey Brothers	£2927
Simpson	2900
Manley & Rogers	2797
Adamson & Sons	2775
Sweet	2743
Sims	2690

Staplehurst.—For erecting school buildings for School Board, Staplehurst:—

Small	£3689	17	6
Richardson	3495	0	0
Reeves	3375	0	0
Cox	3260	0	0
Bridge (accepted)	2357	0	0

Twickenham.—For alterations and additions to Bellevue House, Twickenham. Mr. W. G. Wallis, architect:—

Fish	£2095
Higgs	1987
Messum	1972
Axford & Whillier	1914
Hiscock	1775
Langham	1740
Knight	1665
Lisle	1630
Hurst	1590

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Do.	do.	13 by 8	2 17 6	16s. 6d.
Do.	do.	13 by 7	2 5 0	14s.
Do.	do.	12 by 7	1 18 6	13s.
Do.	do.	12 by 6	1 7 6	11s.

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MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

Chester, October 31.—For plans for the alteration and improvement of S. Paul's Church, Boughton. The architect whose plan is most approved will be employed as the architect of the works, on the usual conditions, and a premium of £20 will be given for the second best.—Rev. H. Falloon, S. Paul's Parsonage, Chester.

Devizes, October 9.—For designs and estimates for an Odd Fellows' Hall and Institute.—Mr. W. H. Hill, The Green, Devizes.

Kingswinford School Board, October 1.—For a design for school buildings to accommodate 800 children, with class-rooms, master's and mistress's houses. Premiums of £10 for the best and £5 for the second best designs.—Mr. J. L. Holberton, Clerk to the Board, High-street, Brierley Hill.

The Royal Northern Agricultural Society (Dwellings for Agricultural Labourers), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 85, Union-street, Aberdeen.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Adel (near Leeds), October 2.—For the erection of a residence.—Mr. S. E. Smith, Architect, Leeds.

Admiralty (Whitehall), Sept. 24.—For Downton's pumps and water-closets.—Mr. F. W. Rowsell, Superintendent of Contracts, Admiralty, Whitehall.

Admiralty (Whitehall), October 1.—For articles of naval brassfoundry.—Mr. F. W. Rowsell, Superintendent of Contracts.

Aldershot School Board, September 30.—For the erection of schools, residences, &c.—Mr. G. B. Musselwhite, Architect, Basingstoke.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

Brighton School Board, October 4.—For the erection of public elementary schools for 750 children, on a site between Richmond-street and Sussex-street.—Mr. T. Simpson, Surveyor to the Board, 16, Ship-street, Brighton.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner Land and Works, Victoria, British Columbia.

Cardiff, September 25.—For the construction of sewers and contingent works in Woodville and Westbourne-terrace.—Mr. George Salmon, Town Hall, Cardiff.

Castlisland Railway Company, September 28.—For the construction of the proposed line from Gortallea to Castlisland.—Messrs. Cotton & Flemyng, 3, Harcourt-place, Dublin.

Coventry, October 7.—For the erection of Spon-street Schools.—Mr. T. H. Kirby, Clerk to the Board, Coventry.

Danby School Board, October 2.—For the erection of a school-room, master's residence, and out offices at Castleton.—Mr. T. Jackson, Clerk to the School Board, Danby, Yarmouth.

Darlington, September 25.—For erecting and finishing a fever hospital.—Mr. G. G. Hoskins, architect, Northgate, Darlington.

Dublin Port and Docks Board, October 2.—For the supply of 1,000 tons of Portland cement.—Mr. N. Proud, Secretary, Port and Docks Office, Dublin.

Featherstone Burial Board, September 28.—For enclosing the new burial ground and erecting chapels, &c.—Mr. W. Gower, Manor House, Featherstone, near Pontefract.

Heaton (near Bradford), September 25.—For the erection of a residence, with conservatory and outbuildings.—Messrs. Milnes & France, Architects, Cheapside, Bradford.

High Wycombe, September 23.—For additions to the infirmary of the union house at Saunderton.—Mr. Thomas J. Reynolds, Clerk to the Guardians, High Wycombe.

Huddersfield, September 23.—For the erection of stabling, outbuildings, and boundary-walls for Hartishead Vicarage.—Mr. T. W. Helliwell, Architect, Brighouse.

Huddersfield, September 24.—For the ammoniacal liquor made at the Corporation Gas Works.—Mr. J. Burgess, Engineer and Manager, Gas Office, Leeds-road, Huddersfield.

Ilkley, September 30.—For the erection of a house in Skipton-road.—Mr. W. H. Parkinson, Architect, 54, Albion-street, Leeds.

Ipswich, September 25.—For the erection of school buildings in the Wherstead-road; and also in Spring-road and Argyle-street.—Mr. F. A. Hammond, Clerk to the Ipswich School Board, 27, Berners-street, Ipswich.

Kidderminster School Board, October 9.—For the erection of new schools for 600 children.—Mr. J. T. Meredith, Church-street, Kidderminster.

London, October 7.—For the erection of a new chapel on the south side of the Holborn Viaduct.—Messrs. Lockwood & Mawson, Architects, 10, Lincoln's-inn-fields, W. C.

Market Drayton, September 30.—For repairing the highways.—Mr. George Gordon Warren, Clerk to the Highway Board, Cheshire-street, Market Drayton.

Metropolitan Board of Works, September 26.—For the construction of a Portland cement concrete sewer, about 300ft. in length, and other works near Hammersmith Bridge.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

Metropolitan Board of Works, October 3.—For the construction of engine and boiler-house, chimney, coal-vaults, reservoirs, dwelling house, wharf-wall, and extension of low level sewer, westward to the Chelsea Embankment, with other works for the Western Pumping Station, to be erected on a site in Pimlico.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

Metropolitan Board of Works, September 26.—For the construction of about 11,135ft. of brick sewers.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens.

Newnham (Gloucestershire).—For the alteration of house and premises, together with the erection of a new house and shop, for Mr. Henry Preece, Cinderford.—Mr. J. H. Evins, Architect, 132, S. Owen-street, Hereford.

North-Eastern Railway, October 3.—For the construction of a bridge, and alteration of the Stockton and Norton-road.—Mr. C. N. Wilkinson, Secretary, York.

North-Eastern Railway, October 3.—For the construction of the Melmerby and Masham Branch Railway.—Mr. C. N. Wilkinson, Secretary, York.

Pembury School Board, September 24.—For the erection of new schools and teacher's residence at

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 4, 1872.

ROMANESQUE ARCHITECTURE.

THE article by Mr. Freeman on Romanesque architecture in the present number of the *Fortnightly Review*, and a paper on German Romanesque in last week's *Saturday Review*, present some features of interest to professional readers. The main point, indeed, in the former essay, the assertion that the Romanesque style was, in its essence, a perfecting and not a debasing of Roman architecture, is nothing new. Mr. Garbett, in his suggestive little work on Design, published more than twenty years ago, had said the same thing, and had illustrated it in part by the same examples as Mr. Freeman. To do him justice, he had said it better, and had carried his principles more fearlessly to their legitimate conclusion. The position which is insisted on is this: all architecture that deserves the name rises out of and emphasizes the construction on which it is based. Thus, for instance, Greek construction was wholly on the principle of the lintel; a flat stone from column to column, or from pier to pier, spanned every opening; and Greek architecture consists in the development and exhibition of this lintel system; it avows it, adopts it everywhere, and emphasizes it by its decoration. Gothic construction, on the other hand, proceeded wholly on the principle of the Pointed arch, and Gothic architecture consists in the development, exhibition, and adornment of a pointed arch system. Thus Greek and Gothic attained harmony and perfection, each in its separate way.

But, when we turn to the works of the Romans, we turn from harmony to discord. Instead of one system dominating over and evolving every detail down to the smallest, we find in the same buildings two incongruous and antagonistic principles. Practically, and for all except the smallest openings, the Romans adopted the arch, but their architecture was purloined from the Greeks, and was a mere screen to the structures on which it was applied. They had not invention enough to devise an arched style, nor self-denial enough to avoid the use of arches, and so they put up a series of shams and self-contradictions such as no artistic race could have endured for a day. Now, the whole transition to Romanesque, as Mr. Freeman says, and even the whole transition down to complete Gothic, as Mr. Garbett still more truly says, was a continual getting rid of shams and incongruities, and the end of it was that arched building cast off its borrowed lintel decoration, and expanded into the magnificent arched architecture of the middle ages.

Mr. Freeman seems inclined to make more of the difference between the Round and the Pointed arch than we should do. We should not, for instance, look on the mere form of the arch as being the vital difference between Romanesque and Gothic. We could point—at Canterbury, for instance, to go no further—to round-arched work, which is yet characteristically Gothic; and, on the other hand, to work like S. Tront, and other French Byzantine churches, which unites the Pointed arch to all the expression of Romanesque. There is a far more important structural difference—the presence or absence of the buttress, and till this feature was developed, we hold that any arched style, whether Round or Pointed, had something still to seek.

This is the true secret of the imperfection which every one, consciously or unconsciously, attributes to our Norman and its allied styles. This is what makes them clumsy and barbarous: that they had not learned the secret of making abutments show *as* abutments — that their piers, like the Roman ones which they had laid aside, pretended to support a vertical load, while they really resisted a diagonal thrust. They had got rid of a good deal of sham architecture, but they had not perfected their own real architecture, for they had not displayed one main feature of their real construction. This Mr. Freeman seems to overlook. He seems to have a fancy, as Mr. Petit had before him, for a round-arched style; and with such a fancy we have no quarrel.

There is much of interest in imagining what might have been made, or might still be made, of the semi-circular arch, supposing it to be adopted by a race of artists like those of the thirteenth century. All we have to insist on is, that a round arch, like a pointed one, needs abutment, and that the style cannot attain perfection unless this abutment declares itself for what it is. This once done, the difference between a Round and a Pointed style would, we imagine, be but small; and, in fact, we may already see what it would be, by referring to dozens of buildings, Early French and other, where the very conditions we have referred to already exist. Round-arched Gothic is by no means rare, and has often the highest beauty and interest; but it is, after all, no more than a variety of the more prevalent style of the middle ages. It has reached harmony and perfection; but it has reached them by ceasing to be Romanesque.

Yet, after all, there is a group of buildings; there is a phase of style, in which Romanesque, in its inmost essence, does reach something like perfection. The most interesting and the most picturesque of all round-arched structures does exhibit this mode of building, arrived at a goal of its own. We refer to the Apostles' Church, and other kindred ones around Cologne. Unlike all other Romanesque productions, these have harmony, unity, completeness; yet the buttress is still wanting, and there is no visible transition into Gothic.

How is this? Were we wrong in saying that a round-arched architecture needs buttresses, and is imperfect till it gets them? No; on the contrary, these exceptional examples are the strongest proof of the rule. The secret is, that we here see the dome superadded to the arch, and for the dome uniformly thick walls of Romanesque work are the very thing structurally needed. The arch and the cross vault, which is only a scientific way of using arches, both alike call for a buttress, for both alike concentrate all their thrust on particular points of the wall, and the buttress once granted they both lead to something differing very little from what we are accustomed to describe as Gothic. The dome, on the contrary, has a thrust against the whole line which supports it; it naturally demands thick walls capable of resisting this thrust, and the Romanesque style as naturally supplies them. Some further development there yet requires to be made; the thrust-resisting character of the walls, marked as it to some extent by the arcades which lighten their upper stage, and the wide plinths which project from their lower portion, yet remains to be emphasized more strongly.

On the whole, however, the round-arched style comes in these examples nearer to completeness than anywhere else; it acquires more distinctiveness, character, and individuality, and, curiously enough, the reason is not that its construction has proceeded further towards developing an appropriate architecture, but that its architecture has incorporated a fresh system of construction which happens to harmonise with and suit it. The result of the whole seems to be, that if we want to work out a round-arched style that is not to be Gothic, the best thing we can do is to engraft upon it the dome. Probably one thing remains that would be better still, and that is, to engraft the dome on the earliest Pointed style.

PRIVATE DWELLING-HOUSES AT THE VIENNA EXHIBITION.

AT the forthcoming Universal Exhibition to be held at Vienna, in 1873, a prominent feature will be made of the private dwelling-house by placing it in a group by itself. This group will, it is hoped, assist in the solution of one of the most important social questions of the present day. The object of the Commissioners is not so much to form a collection of ethnographical examples, or to show the construction and arrangement of the ordinary private dwelling houses of different countries, as it is to point out what is considered by the inhabitants of these countries the best mode of building, taking into consideration the climate, local circumstances, and mode of living existing therein. Thus, for example, a very common error in former attempts to provide dwellings for the working classes has been the construction of huge piles of bricks and mortar, in which there is no exclusive ownership beyond the two or three rooms having a a separate entrance, and the right of way down a common staircase. Whatever may be the economical or architectural advantages of this plan, known as the "barrack system," it has failed in almost every instance, owing to the dislike of the very persons who were intended to profit by it. Again, it is very doubtful whether the "flat" system has any future in London among the better classes. The experiment in Victoria-street has found but little favour among us, and wherever this plan has been repeated it has usually developed itself into a mere modification of hotel life. In countries where this plan exists it has been found that besides the danger of overcrowding, we have the even greater evils of the loosening of the family tie, with injury to health and morality. On this account, therefore, the tendency everywhere is to restore the old family dwelling-house, arranged in such a way as to suit the requirements of modern life.

The intention, then, of the group destined to represent the private dwelling-house—firstly by models, drawings, or complete buildings, and secondly by similar examples of individual rooms only—is to display all the apartments, even down to the kitchens and cellars, fitted complete with every requirement for modern housekeeping, including all the most approved recent contrivances, the whole being ready for immediate use.

It is hoped by this means to present to the visitor a most complete illustration of the varied domestic arrangements of all countries, and one which he could obtain in no other way. Architects will thus be enabled to exhibit the dwelling-houses best suited to the climates and habits of their countrymen, and those interested in the important social problems herein involved will be in a position to make the most instructive comparisons, and to select and adopt such of the details as may appear to them novel and valuable. It is, moreover, intended that as far as possible these houses, besides being completely decorated and furnished, shall be inhabited.

By thus grouping together in their actual positions the handiworks of the cabinet-maker, the upholsterer, the painter, the joiner, and the potter, the visitor to the Exhibition will have every chance of arriving at a true conclusion as to their respective merits.

In connection with this group it may be as well to draw the attention of English manufacturers and exhibitors to a class of dwellings for which this country is justly distinguished—namely, labourers' cottages. Of late years we have given much consideration to this subject, and are far ahead of our continental neighbours. Some good models and cottage plans would not fail to attract a great deal of notice. Our cheap buildings, again, in iron, of the class known as "temporary buildings," would also be well worth representing at Vienna, as constructions of this kind are almost unknown there. We have but little doubt that if introduced by enterprising firms (and such are not wanting in this country) iron buildings would meet with a ready sale. It would, we think, be found a very profitable investment to take over a number of iron houses of various kinds in order to put them up in the Park previous to the opening of the Exhibition. House rents in Vienna, owing to the dearth of accommodation, are at present enormously high, and a cheap and readily-erected building would find great favour there. Of course, there are a great many objections to iron houses, especially in cold climates; but with a little care and modification it appears to us that for temporary residences iron buildings would be found to be the best and cheapest, particularly in a country where the better class building materials are very costly. Thus, we are informed that the prime cost of bricks in Vienna is from 50s. to 60s. per thousand, and other material in proportion. In fitting up such constructions an excellent opportunity is afforded to English manufacturers to exhibit our furniture and fittings, and to show these objects in actual use. Open stoves are almost unknown in Germany, kitchen ranges again, find no counterpart abroad. Gas stoves and small contrivances for warming halls and conservatories are much needed. English furniture and wall-paper is, where it has been introduced, greatly admired, and our bedroom furniture should be adequately represented. Of course it is too much to expect of the English Commissioners that actual specimens of an English mansion, a villa, and a labourer's cottage should be displayed at Vienna, but we think that the opportunity should be embraced as far as possible of showing foreigners why it is that in England, above all other countries, we are able to enjoy the comforts and advantages of what no other European language, we believe, has a word for—"home."

FOUNDATIONS.—II.

CONCRETE.

IN making concrete, some people say mix as much sand or fine gravel with the broken stone or gravel as will fill up the interstices, and thus make a solid mass, but we have to consider that when this is done the lime or cement aggregates itself about the smaller particles, and leaves the larger stones comparatively bare; so that concrete thus made has little or no more cohesion than a body of gravel that is naturally deposited, for, except in the case of seacoast shingle, which is a distinct substance from ordinary gravel, nature has already filled up all the interstices of the gravel pebbles with sand and finer gravel. Now, however admirable may be the operations of nature in this respect, we aim at something better for our purposes in making concrete, which is essentially an artificial substance. We have, then, to consider this, whether by the addition of lime or cement to the chief component of concrete we shall make it better by filling up the interstices of the larger particles with concreted sand and fine gravel, or whether we shall, by excluding small particles as much as possible, make the lime or cement stick together the larger particles. To determine this question we must take into consideration how much lime or cement is allowed to be used. If it is allowed *ad libitum* we should make the very best concrete by adding to the clean gravel just so much fine material as to fill all the interstices, and the result would then be that the larger particles and the smaller would all be cemented together into a conglomerate rock, for the excess of lime or cement more than is taken up by the fine material then attaches itself to the larger stones; but as economy must be considered, the quantity of lime or cement is limited to some given proportion between it and the chief component. It is seldom that more than 1 of lime to 6 of gravel or broken stone is used, by measure, and more often 1 to 7; and as there are 21 bushels in a cubic yard, every cubic yard of gravel or broken stone requires, with this proportion, 3 bushels of lime. At first sight it would seem strange that there should exist any difference of opinion about the best method of making and depositing concrete, and yet there is such a difference. Some people say tip it into the foundation from a height—say 10ft., but do not meddle with it afterwards; while others say wheel it in, and deposit it quietly, and ram it; but this difference of practice may be accounted for and explained by the following considerations. If fine material is mixed with the coarser, and they be thrown down together from a height, with the intention of consolidating the mass, the larger material becomes separated from the smaller while falling, and the concrete is found to be in some places an aggregation of large particles and in others of small particles, the separation being due to the difference in the specific gravity of the materials, and the mass being then less homogeneous is of course less strong, for the strength of concrete, like that of any other material upon which weights are laid, depends upon its frictional stability, and if the particles of which it is composed are so disposed that they readily slide upon each other there will be little or no stability. A mass of clean shingle will not carry much weight, for however hard the individual particles may be, they slide upon each other laterally, and allow the weight to sink. If these are cemented together the mass will carry a greater weight by reason of the attachment of the cement, and to the degree of its strength. If now, in addition to the attachment of the shingle by means of cement the interstices were filled, without being over-filled, with finer material, as sand or fine gravel, the strength would be still more increased, because this filling up of the intersects would oppose another obstacle to the sliding of the pebbles upon each other; but that which makes this attempted filling of the interstices practically useless and unattainable is that it cannot be equally and uniformly ensured throughout the mass, the mass consisting in some places of aggregations of large particles and in others of smaller. Now, if this reasoning be correct, it follows that the concrete will be stronger if the finer material be excluded, and, further, that the best concrete is that which consists of angular stones which interlock with each other. Here, then, is to be found the explanation of the difference in practice, when in one case the material is tipped from a height and in another is deposited quietly, for with angular materials of an even size and specific gravity the greater the height from which they are thrown in the greater the consolidation will be, while in the other case the less the height the better. In mixing concrete composed of angular stones alone each one is surrounded with its due quantity of lime or cement, which adheres to it during its descent, but if inadherent sand or fine gravel be mixed with it, not only will a separation of the proper relative positions of the materials take place in their descent, but the larger particles will be robbed of their due quantity of lime or cement by the smaller.

It is to be remarked, however, that, even with angular stones, where the concrete is thrown in from a height, the lime or cement will in some degree be shaken off the stones, and although, if we could deposit the mass in very thin and even layers, that which might be separated from one barrowful would attach itself to one below it, and so a compensatory action take place, yet we cannot, or at least do not in practice, spread out the layers sufficiently thin to cause this to take effect. The consideration, then, is whether in any case concrete should be thrown into a foundation from a height, or whether it should not rather be wheeled in upon the level, and deposited as quietly as possible. If it could then be rolled with heavy rollers, the best concrete would probably in that way be made, but as in most cases this could not be done, punning is sometimes recommended to effect a similar purpose. Now, as to punning, there are two considerations belonging to it. Lime or cement deposited dry—that is not absolutely in water—should not be disturbed after it has once begun to set. If a broad and heavy roller could be drawn over each layer as soon as it is deposited, the consolidation might be effected, or if broad stampers could be substituted the same might be done, but with small punners or rammers it is probable that the action of each petty blow is merely to shift the material laterally, and to still further separate the coating of lime or cement from the stones without effecting a real consolidation.

So far as this lateral movement presses out the material more closely to the sides by which it is confined, whether that be sheet piling, or the sides of a trench or of a foundation pit, it is good for that reason, as it tends to prevent further spreading of the concrete when the weight of the superstructure and its load is laid upon it. The question, then, is whether a mass of angular stones, which interlock with each other, spread in thin layers and punned so as to press it firmly against the sides, or else tipped from a considerable height, is not more unyielding than a mixture of large and small particles imperfectly cemented together with lime or cement, and either punned or thrown from a height.

That in the London district, where plenty of clean ballast, or coarse and fine gravel and sand naturally mixed, is used with a due proportion of good Portland cement, or with ground blue lias lime, most excellent concrete is made, there can be no doubt; but its excellence would appear to be due wholly to the goodness of the cement, and good Portland cement is not procurable everywhere and by everybody who may use concrete, and if it were, and if a due proportion of it were allowed, clean gravel is not to be had everywhere; but granting that all these are procurable, and allowed in due proportion, the mixing is often so clumsily done as to make null and of no effect the best materials. In short, from these considerations it would appear that a closely packed bed of angular stones is a better foundation than one of weak concrete.

If this be true of dry foundations it must be more true of those deposited in water. When ground lime or Portland cement is mixed with ballast and thrown into water, even though it be but a few inches in depth, and though it be quiet, the best part of the lime or cement—that is, the silicates—will be washed out and form a skin on the surface of the water, leaving the gravel bare. There are many devices to prevent this, such as lowering the concrete down in bags and emptying them at the bottom; shooting the materials down wooden trunks, &c., and the difficulty of retaining the cement in the concrete when water is present induced Mr. Kinipple to adopt a method which is directly opposed to one of the principles that it has always been thought necessary to observe in dealing with cement, that, namely, that it begins to set as soon as it is mixed, and therefore that its crystallisation ought not to be interfered with by working up again cement that has become partially set. But in the discussion on Mr. Grant's paper on the strength of cement, read at the Institution of Civil Engineers, Mr. Kinipple described his method to be to mix the materials on the top with just sufficient water, and to turn them over and spread them out in a thin layer, and when, in a few hours' time, they have become a stiff but not dry mass, to break it up and deposit it in the foundation in a crumbling state, by which means he was able to retain all, or nearly all the cement, in the mass of concrete. But when it becomes expedient to throw overboard a recognised principle in order to accomplish any given end, it may well be supposed that there is something wrong somewhere, and that which is probably wrong in this case is that the cement was not finely ground, and not thoroughly air-slaked before use, whereby a reserved power of cohesion would ensue, which would be brought into action when the material was broken up, and redeposited in water.

ORIGIN AND GROWTH OF ROMANESQUE ARCHITECTURE.*

THE only sound classification of styles of architecture is that which arranges them according to their leading principles of construction. Of such principles, as far as we know at present, there are only three; more accurately speaking, there are only two, one of which again falls into two great subdivisions. The two great systems of construction are the Entablature and the Arch, and the arch again may be either round or pointed. We thus get three distinct forms of construction, the Entablature, the Round Arch, and the Pointed Arch. And each of these principles of construction has been, in its own time and place, the animating principle of a style of architecture. That is to say, there have been times and places in which each of the three has not only been the prevalent form of construction, but has been accompanied by an harmonious and consistent system of decoration. Each of the three constructive principles may be looked on as the expression of an æsthetical principle. In the case of two out of the three this is generally acknowledged. It is universally felt that the architecture of the entablature is the expression of horizontal extension, that the architecture of the pointed arch is the expression of vertical extension. It is generally acknowledged that the perfection of the horizontal idea is to be found in the highest form of the architecture of the entablature—that is, in the architecture of old Greece. It is generally acknowledged that the perfection of the vertical idea is to be found in the highest form of the architecture of the pointed arch, that is in the Gothic architecture of mediæval Europe. It is not so generally acknowledged that the intermediate form of construction, the round arch, has also its leading æsthetical idea. It is not so generally acknowledged that there have been times and places in which the round arch also has produced a style, not perhaps approaching so nearly to ideal perfection as either of the other styles, but still coming near enough to it to be set alongside the other two as an independent and equal form of art.

Yet, if we admit the entablature, the round arch, and the pointed arch to be the three chief, and seeemingly the three only possible, forms of architectural construction, it seems necessarily to follow that the round-arched construction must have its leading æsthetical idea no less than the other two, and that it must be capable, no less than the other two, of an ideal perfection. Whether it has ever actually reached its perfection or not, whether it has ever come so near to it as the other two have, is a question which is not now to the point. It will not do to say that there is a perfection of the arched style, but that its perfection must be looked for in the architecture of the pointed arch, and that the architecture of the round arch is an imperfect form. The answer is plain; the round arch is constructively as good a form of construction as either the entablature or the pointed arch. As a mode of building, it stands on a perfect level with them. Now, if we admit that all good and honest architecture consists in finding appropriate forms of decoration for good and honest forms of construction, it would seem to follow that every good and honest form of construction must be capable of finding some appropriate form of decoration, and of thereby reaching an ideal perfection. It seems, then, to follow that the architecture of the round arch has a right to be looked on as an independent form of art on a perfect level with the architecture of the entablature and the architecture of the pointed arch. Of course, it does not follow that it has ever been actually carried so near to ideal perfection as either of the other styles. It is enough if we allow that it has, like them, its leading idea, and that it is capable of an ideal perfection, whether it has ever actually reached it or not.

Some of the causes of the general unwillingness to admit the claims of the architecture of the round arch to an equal place alongside of the other two great forms are obvious enough. First of all, I am free to admit that the architecture of the round arch never has, as a matter of fact, been carried so near to perfection as both the other two forms have. There is no round-arched building so absolutely satisfactory as a work of art as either the best Grecian or the best Gothic buildings. In comparing Romanesque and Gothic buildings, a much greater share of the charm of the Romanesque building belongs to its age and its historical associations, a much less share to its actual merit as a work of art. I know not how others may feel, but to my own mind this is proved by the following test. A modern Gothic building, if it be really as good as an ancient one, is as satisfactory as an ancient one. But a modern Romanesque building is, to my mind at least, simply grotesque. The more closely it reproduces an ancient building the more grotesque it becomes. This, I think, proves that, in the case of the Gothic building, we do, in the strictest sense, admire a work of art, while a great part of the charm of the Romanesque building is derived from other sources. But, if round-arched architecture has never been actually carried so near to perfection as the other two styles, that fact in no way disproves its abstract capacity of reaching an equal relative perfection. Secondly, though I believe the round-arched style to have a leading idea equally with the other styles, and to have equally with them an appropriate form of decoration, yet neither the leading idea nor the appropriate form of decoration is quite so obvious in the case of the round-arched style as it is in the case of the other two. There is something negative about all the characteristics of round-arched architecture. While the leading idea of the architecture of the entablature is that of horizontal extension, while the leading idea of the architecture of the pointed arch is that of vertical extension, I take the leading idea of the round-arched style to be that of no extension either way, but of simple rest and immobility. The round-arched form again has another peculiarity. No other can so well dispense with ornament. Either a Grecian or a Gothic building would be wholly intolerable, if it were so utterly void of ornament as many Romanesque buildings are which are perfectly satisfactory in their own way. Indeed, we may safely say that, the larger a Romanesque building is, the plainer it may be, perhaps ought to be. A small chapel in that style is commonly much richer than a great minster. What, too, is the nature of Romanesque ornament, when we get any? It is again something of a negative kind. The Greek mouldings are of a kind which serve to strengthen the horizontal lines supplied by the construction of the building. The Gothic mouldings are of a kind which serve to strengthen the vertical lines supplied by the construction of the building. In Romanesque neither of these forms seems appropriate. A round arch moulded after either the Grecian or the Gothic fashion is never satisfactory. Either the horizontal or the vertical idea is suggested, and each of them is inconsistent with the spirit of a style whose leading idea is pure rest and immobility. Moulding, indeed, in the strictest sense of the word, moulding which affects the section, is really out of place in a Romanesque building. The true Romanesque ideal leaves the orders of the arch in their natural square section, and seeks enrichment by ornament on the surface, whether by coloured ornament, as in Italy, or by what we may call surface-moulding, as in our own Norman. At most it attaches a heavy roll—a continuation of the jamb-shaft—to the square section, instead of carving the square section itself away, as in the Gothic system of mouldings. In all this we see the negative character of the style. It has a leading idea; it has an appropriate form of ornament; both are capable of definition; but both are perhaps most easily understood by describing them as something which is neither Grecian nor Gothic. Again, in our Northern Romanesque, though there is a stateliness and majesty above all other styles, there is seldom anything to be called real beauty of detail, such as we find in Grecian on the one side and in Gothic on the other. The truth is that the time when the round-arched style came nearest to perfection in the general design of its buildings was a time when, in northern countries at least, the decorative arts were at a very low ebb. An English sculptured capital of the thirteenth century is, in its way, as beautiful as anything in Greek art. But when a capital of the eleventh or the first half of the twelfth century anywhere north of the Alps attempts sculpture, animal or vegetable, the effect is simply grotesque. We may apply the test which I before gave. A modern reproduction either of a Corinthian or of an Early Gothic capital may be fully as pleasing to the eye as the original. But a modern imitation of an enriched Norman or Lombard capital, with its rude volutes and its strangely disproportioned men and beasts, is not pleasing, but ridiculous. It has not the charm of antiquity and historical association which belongs to the original, and it has nothing to put in its place.

This last difficulty, strongly as it may be felt in most Northern and in some Italian Romanesque, would prove nothing at Pisa or Lucca. But all that I have been saying as to the negative character of Romanesque architecture and as to the lack of beauty in its detail, would of itself go far to account for the unwillingness so commonly felt to see in the architecture of the round arch an independent style ranking alongside of the architecture of the entablature and that of the pointed arch. But I think that we have not yet got to the root of the matter. To admit the round-arched style as an independent form of equal rank with the other two, involves giving up a whole train of notions about ancient and modern, Classical, and the like. If we are to admit the claims of the round-arched style as I have put them, we must altogether wipe out the hard and fast line between ancient and modern. We must admit the continuous existence of a style whose earlier examples were the work of "Classical" Romans, while its later examples were the work of Barbarians, Goths, and the like. It would be hard to make many people believe that a really wider line ought to be drawn between two forms of Mediæval work than between one form of Mediæval work and one form of Classical. It would be harder still to make them believe that one form of Classical architecture ought to be looked on as a mere imperfect transition to a style which was brought nearer to perfection at the hands of Mediæval barbarians. To those who take a wider view of general history there is no difficulty in all this. Sweep away the distinction of "ancient" and "modern"—cease to look on things "Classical" as something all by themselves, hedged in from everything belonging to other times and nations—learn to look on history as a whole, and the history of Greece or of Rome simply as a part of that whole—and there will no longer seem anything strange or incongruous in holding that, in architecture, in language, or in anything else, the function of the first century on either side of our æra was simply to pave the way for the eleventh or twelfth century after it. Once grasp the true life and spirit of the long Imperial history, and there will seem nothing wonderful in fixing on the third century, in purely Classical eyes a time of decay and degradation, as a time which alike in religion, in law, and in art, stands out as one of the great creative ages of the world.

The essence of good architecture of any kind is that its constructive system should be put boldly forward, that its decorative system should be such as in no way conceals or masks the construction, but makes the constructive features themselves ornamental. Both in Grecian and in Gothic architecture this rule is thoroughly and consistently carried out. In a Grecian building the entablature is the main feature of the construction, and it proclaims itself as such. In a Gothic building the pointed arch is the main feature of the construction, and it proclaims itself as such. In neither case is there any attempt at concealment or disguise of any kind. But how stands the case with Classical Roman architecture? Here we have a style in which the main feature of the construction is not made the main feature of the decoration. Here we have a style in which the great constructive features seem, as it were, ashamed of themselves, where they try to hide themselves behind a mask borrowed from a different system of construction. The architecture of Classical Rome is, like the literature of Classical Rome, imitative. Italy, the land to which the world practically owes the great discovery of the arched construction, may very likely have had a native architecture, as well as a native literature, in the days of the Kings and the early Consuls. But the architecture of Classical Rome was a mere imitation of that of Greece. It was indeed but an imperfect imitation. The Roman architects were not so besotted as to cast away their own great invention of the arch, and to fall back on the less flexible, less diversified, constructive system of the Greek entablature. But, just as they spread a varnish of Greek forms, Greek metres, and what not, over their native Italian literature, so, in like sort, they spread a varnish of Greek decoration over their native Italian construction. Buildings whose real construction was that of piers and arches were masked with a decorative imitation of the columns and entablature of a Greek portico. But as it was in other things, so it was also in architecture. The true Roman spirit was masked only, and not destroyed, by the fashion of Greek imitation. As that spirit shows itself in the satirists, the historians, and even here and there in the poets themselves, as it stands out more clearly still in the mighty fabric of the Roman law, so there are classes of Roman building in which the national arched construction stands out, masked but feebly, or not at all, by the varnish of Greek decoration. In an aqueduct or an amphitheatre, Greek features, columns and their entablatures, are either absent altogether or are something so secondary as to have but little share in the general effect. In buildings of this kind, the round arch, the main constructive feature, does really stand out as the feature which gives the building its main architectural character. And, as Mr. Petit remarked long ago, the step from buildings of this kind to some of the plainer forms of the later Romanesque is very slight indeed. Some of the great German churches, such, for instance, as the three great Rhenish minsters of Mainz, Worms, and Speier, where the interior elevations consist of square piers supporting perfectly unadorned round arches, have surely a great deal in common with a Roman aqueduct. In both we see the round-arched construction standing boldly out in its most undisguised form. And buildings of this kind, whether aqueducts, amphitheatres, or churches, which rely almost wholly on their unadorned constructive elements, may undoubtedly be grand and striking in the highest degree. Still, a style of architecture would be narrowly limited in its resources if it were for ever confined to such elements as these. The massive, unadorned, square pier was suited for many purposes; but there were also many purposes which asked for something more graceful, something which better offered itself for enrichment. There was one feature of the Greek constructive system which the Roman architect could do something more than blindly imitate. There was one feature which he could really adopt, for which he could find a place in his own system as appropriate as that which it had held in the system to which it belonged by birth. The Grecian column was freely employed by the Roman architects, but for a long time, in truth during the whole of the purely Classical period, it was used only in a feeble, hesitating, and inconsistent way. Roman architects built porticoes and colonnades after purely Grecian models, without bringing in any feature of the national constructive system at all. Or columns and entablatures after the Grecian model were attached as a mere decorative mask to buildings really built according to the national mode of construction. At last, in days which we are taught to look upon as days of decline, in days which are looked upon as days of degradation both for literature and for art, the great step was taken which was to give Roman architecture an harmonious and consistent form, the step which was to make its chief decorative feature become also the chief feature of its construction. In the Greek system the column had boldly and honestly supported the entablature. In the Roman system of construction, the round arch answered to the entablature. What, then, was needed to make the column a real feature in the Roman system was to make it discharge in the Roman construction a duty strictly analogous to that which it had discharged in the Greek construction. In the Greek system the entablature had rested on the capitals of the columns; what was now needed was to make the round arch rest on the capitals of the columns also. This simple change at once gave Roman architecture a form both consistent in construction and graceful in decoration. Next to the introduction of the arch itself, no architectural revolution has been so great and so lasting in its results. The man who first boldly set his arch to rest on the capitals of his columns made a change which led the way to all future developments of arched architecture, round and pointed alike.

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* From an elaborate article by EDWARD A. FREEMAN, in the last number of the *Fortnightly Review*, published by Chapman & Hall.

The first building, as far as we know, in which this great change was made was the Palace of Diocletian at Spálato. No time, no place, no author, could be more fitting for such a great architectural revolution. The change was not made in the local Rome, but on the other side of the Hadriatic, in a land which the Romans of an earlier time had looked on as a distant and barbarous province. But in those days the local Rome had ceased to be the only Rome. Rome was now wherever the Roman law and the Roman language had spread themselves, wherever men submitted to the rule of the Roman Cæsar. And no corner of the Empire was then more truly Roman than the Dalmatian land which sent forth that long succession of wise and valiant Emperors, Roman in every nobler sense of the word, though the local Rome was neither their birthplace nor their dwelling-place. And it was well that the greatest of them all, the founder of the Empire in its later form, should also be the man at whose bidding the first consistent Roman building rose. The keen eye of Diocletian had at last seen that the Roman Commonwealth was at an end; he grasped the fact that the Empire was a monarchy, and, grasping the fact, he had not shrunk from putting it prominently forward before the eyes of men. The Illyrian peasant, in the days of his power, had been the first to deck himself with the outward pomp of royalty, when so to do was simply to give an outward expression to what for many generations had been the greatest of practical facts. The same man, in the days of his voluntary retirement, carried out a change in Roman art exactly analogous to the change which he had already carried out in the Roman polity. Alike in polity and in art, he swept away traditions which had become cumbrous and useless, and let things stand forth as they really were. Alike in recasting the constitution of his Empire and in designing the hall of his palace, Diocletian made the real construction of the fabric stand forth undisguisedly before the eyes of men. Alike in his political and in his architectural creation, he put the crown to the work towards which his predecessors had been feeling their way for three hundred years.

The palace of Spálato I have never seen with my own eyes, but the views of it given by Sir Gardner Wilkinson are quite enough to set its main features clearly before us. The new invention is not, indeed, consistently carried out throughout the whole building; that would have been too much to look for from any architect of any age or country. But it is applied to the long colonnades of the great hall, and noble ranges they are. A consistent round-arched building has at last been called into being, a building of a less massive and a more ornamental type than the aqueduct, or even than the amphitheatre. As the first consistent arched interior, the hall of Diocletian's palace contains in it the germs of all later architecture; the germs not only of Ravenna and Pisa, but of Caen and Durham; not only of Caen and Durham, but of Westminster and Amiens. As such, there is no more memorable building upon earth. But it is in no way wonderful that the great improvement which it offered was not at once universally accepted. Every architectural development has to go through a stage of transition, a stage when the new principle and the old are striving for the mastery, and when the two are mingled together in various degrees and proportions. The architect of Spálato showed that columns could be used as the immediate supports of arches; he did not at once persuade the whole world to use columns as the immediate supports of arches. Men had been so long used to look upon the entablature as the right thing to rest upon the capitals of the columns that they could not all at once bring themselves to let the arch come straight down upon the capital itself. It seemed as if something must be done, as if some change must be made, to adapt the capital to its new duties. Something must be thrust in between the capital and the arch; some fragment, as it were, of the entablature, must come between the abacus of the capital and the impost of the arch. Or perhaps the abacus itself must be enlarged into something like a piece of entablature, or the whole capital must be drawn out to an unusual size and height, in order to seem more worthy of its new prominence, and better able to bear the weight that was laid upon it. For it is manifest, and it is one of the great advantages of the arched construction, that the columns, or other supports of a range of arches, may be placed at much greater distances from each other than the columns of a colonnade supporting an entablature. It follows that each column and its capital assumes in the arched building a greater importance; it has, so to speak, a more distinct separate existence than belongs to the columns of a colonnade. In the later Roman architecture we therefore find all kinds of shifts to avoid that immediate juxtaposition of the arch with capitals of the hitherto accustomed forms on which the architect of Spálato had already ventured. In the basilicas of Ravenna I do not think that there is a single case where the arch comes down immediately upon an Ionic or Corinthian capital.

These wonderful works of Western Emperors, of Gothic Kings, and of Eastern Exarchs, were reared out of the spoils of earlier buildings. Columns and capitals were brought from various quarters; their proportions did not always exactly tally with one another; a column did not always agree with the column which stood next to it, or with the capital which its own shafts supported. But, among all the shifts to which the architects of these churches were driven in order to keep something like order among the columns which were thus strangely brought together, in every case, whatever may be the form of the capital, a member is thrust in between the capital itself and the arch. For such a member there is no real need, either constructive or decorative; it simply shows how men clave to the idea that the proper use of a column and its capital was to support something like the horizontal line of the entablature. The local use of Ravenna preferred the employment of capitals of the received Classical shapes with this needless member interposed—a member which wants a name, and to which that of the *stilt* has sometimes been given.[*] At Constantinople, on the other hand—I speak here not from personal knowledge, but from the Chevalier Fossati's splendid drawings of S. Sophia—though the stilt is not unknown, yet the tendency seems rather to have been towards devising new forms of the capital itself. Some of them, with a different proportion, still keep something like the general idea of a Classical capital, while others, especially the well-known Byzantine basket capital, altogether depart from Classical models. At Ravenna no difference can be discerned between the works of the Roman Placidia and those of the Gothic Theodoric. The wise barbarian who preserved for the conquered Romans their laws, their language, and their buildings, followed their models also in his own original works. But with the recovery of Italy under Justinian new forms came in. In the church of S. Vital, begun during the Gothic dominion but not finished till after the conquest by Belisarius, the new Byzantine forms of capital are seen. But the local custom did not wholly die out, and the stilt appears in S. Vital also, often taking the form of what we must call a double capital, one being placed over the other. The Byzantine forms, in their later development, are found also among the vast stores of capitals, brought and copied from all possible quarters, which are to be seen in the portico and the galleries of S. Mark's at Venice. But for true columnar arcades, like those of Ravenna, we must leap over several centuries, till we come to the works of the eleventh and twelfth centuries at Pisa, Lucca, Murano, and Torcello. Here, with the changes of detail which are natural after a space of eight hundred years, we come back to the same state of things which we saw at Spálato. The arch again rests immediately on the capital of the column, and the columns and their capitals are either Classical remains used up again, or else they are as nearly imitated from Classical models as the art of those ages would allow.

It certainly seems to me that, in these great Italian churches, we have before us a distinct round-arched style, an independent form of architecture worthy to rank side by side either with the architecture of the entablature or with the architecture of the pointed arch. One of the three great forms of construction, a form constructively as good as either of the other two, is here provided with a good and consistent decorative system. It is hard to see what more is wanted. It is hardly possible to conceive any architectural forms more perfect and stately than the arcades of the nave of Pisa. The decorative forms are consistent and elegant; in some, indeed, of the later buildings of the style, especially at Lucca, they put on an almost extravagant richness of detail, but yet without departing from the purity of the round-arched ideal. But if we admit that the columnar form of the Italian Romanesque is a pure and genuine style, that it is a legitimate decorative carrying out of one of the great types of architectural construction, it follows that the architecture of Classical Rome must be looked on as something imperfect and transitional. The Romanesque of Pisa and Lucca is the Classical Roman set free from the incongruous elements which clung about it, set free from all traces of the days when Roman architecture was a mere imitation of Grecian form. The one Grecian feature which could be really adapted to the Roman principle of construction has been adopted and naturalised, and it has been proved to be capable of doing as good service in the new system as it did in the old. If here and there traces of another system of decoration may be found hanging about the buildings of this style, they are in positions so unimportant as to be of little consequence in the general effect. They in no way interfere with the claim of the columnar Romanesque to be looked on as a pure and independent style, as the consistent carrying out of an architectural conception which the Classical Roman attempted only very imperfectly. Paradoxical, then, as the position may sound, I think that I have made out my case, and that the Classical Roman is essentially an imperfect style, a mere transition to the more perfect Romanesque.

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GERMAN ROMANESQUE.

[From the *Saturday Review*.]

WE last year wound up a series of papers on several of the chief cities of Northern Italy with a general view of the characteristic features of the style of architecture which is most specially distinctive of the country. That is the

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[*] It is worth noticing that something very like the Ravennese *stilt* is to be found in the ancient Egyptian architecture, in the form of a member, the *de*, interposed between the capital and the entablature. In some forms of Saracenic architecture this stilt becomes a most important feature.

Italian Romanesque, the style which reaches its highest stage of beauty and majesty in the great cathedral of Pisa. We purpose now to wind up the desultory comments which we have lately been making on some of the great buildings of Germany with a similar general view of the contemporary architecture of that country. Italy and Germany may indeed be looked on as forming one Empire architecturally, just as they so long did politically, as distinguished from the lands to the west of them. The history of the art in the two lands has much in common as distinguished from England or France. In both we can hardly hesitate to say that the Romanesque buildings claim the highest place in historical interest, perhaps even in artistic merit. In Italy there is, of course, no doubt of it; one can hardly keep one's patience with the nation which, having worked out so pure and beautiful a style as the best Italian Romanesque, could throw it aside for the poor imitations of foreign forms which pass as Italian Gothic. In Germany, of course, this is not the case; Germany, as all the world knows, contains some of the most perfect and admirable specimens of Gothic architecture which ever were reared. Yet in Germany, as in Italy, it is the Romanesque buildings which are the most truly native; they are those which we at once feel to be exclusively characteristic of the country, at home there and out of place everywhere else. Gothic seems in Germany, as in Italy, to be something of foreign birth, but with one most important difference. In Italy, the foreign style never took root; it turned out the elder national style, but it never became naturalised itself; Italian Gothic is not Gothic, but a mere unsuccessful imitation of the Gothic of Germany, France, or England. In Germany, on the other hand, the foreign style thoroughly took root; it developed a national variety, ranking alongside of the national varieties which grew up in other lands; but still it never produced forms so thoroughly native, so thoroughly the growth of the country and characteristic of it, as the forms of the German Romanesque. If any one were called on to pick out a building that should be specially and unmistakeably German, it is almost certain that he would pick out a Romanesque building. If he were called on to pick out a building that should be specially and unmistakeably French or English, it is almost certain that he would pick out some form of Gothic. We go to Köln, and in the metropolitan church we admire one of the architectural wonders of the world; but if we want to see something not belonging to the whole world, but specially belonging to Germany, we go to the church of the Apostles, of S. Martin, of S. Mary in the Capitol. Perhaps all this is as it should be. It is, perhaps, fitting that the style, which in all forms still bears the undying impress of Rome, should be, above all others, the style which is felt at once as most native and characteristic in both of the two great Imperial realms.

We believe that we have, in talking of these matters, more than once put forth the doctrine that up to about the middle of the eleventh century one common style of architecture, of Italian origin, prevailed throughout Western Europe. Of this common Primitive style the oldest remains, not being strictly Roman, through all the western lands are examples, our own so-called "Anglo Saxon" buildings among them. But in Aquitaine, France, Normandy, and England, this common Primitive style was supplanted by local styles, Romanesque like itself, but having local characteristics of its own, just like the French, English, and German varieties of Gothic in after times. In Italy and Germany, on the other hand, it can hardly be said that this process of supplanting took place. In Germany, above all, we should rather say that the Primitive style was kept in use, retained, improved, and developed, all through the eleventh and twelfth centuries. The best German Romanesque of the twelfth century has less in common with our Norman of the same age than it has with our so-called "Anglo-Saxon" of the age before. That is to say, it is not a new style, supplanting the Primitive, as happened in Gaul and Britain, but an improved form of the Primitive style itself. Thus far Italy and Germany have points of agreement in their architectural history, as contrasted with England, France, and Aquitaine. They have points of agreement also in the history of the process by which Romanesque went out of use. In England the transition from Romanesque to Gothic takes up the greater part of the last half of the twelfth century; a few pure Gothic buildings are found before the end of the twelfth; no buildings of even the first decade of the thirteenth century show more than the last faint traces of the departing Romanesque. The Transitional period in France is pretty well contemporary with that in England; but the development is in some points slower, in others quicker; quicker in windows, slower in mouldings, pillars, and their capitals. No one can call either Salisbury or Amiens anything but perfect Gothic; but it has been remarked over and over again that the windows at Amiens are more advanced than those at Salisbury, while the pillars at Salisbury are more advanced than those at Amiens. But, both in France and in England, the Gothic grows by slow stages out of the earlier Romanesque. The pointed arch is first introduced into the main arches of the building; then it makes its way into the smaller decorative arches; lastly, forms of moulding and other enrichment are worked out which better harmonise with the new construction than those which were before in use. But all these stages are pretty well over by the first years of the thirteenth century. In Germany, however, just as in Italy, we find round-arched buildings down to the end of the twelfth century, and even a good way into the thirteenth. These round-arched buildings may, indeed, show signs that a change is coming; they may depart in some things from the purity of the Romanesque ideal; they may even show a few pointed arches mingled with the round; but their whole feeling and general effect is still Romanesque, not Gothic, hardly even Transitional. All this is the case in Italy also; in neither country is there any Transitional style in the same sense that there is in England and France; the German Transition, Limburg, for instance, is simply a modified Romanesque. It does not seem as if the German Gothic, like the French and English Gothic, grew out of the earlier style; it rather supplants the Romanesque, just as the so-called Italian Gothic supplants the Italian Romanesque; the only difference is that in Germany Romanesque is supplanted by real and good Gothic, while in Italy it is supplanted by a sham. But in both cases the new style, whatever it is, seems to come in pretty well ready-made. The introduction of Gothic into Germany was, if we look to dates, more like the introduction of the Norman form of Romanesque in England. We are amazed to find that Ealdwine's work at Jarrow is only twenty years older than William of S. Canilef's work at Durham; it has more in common with the work of Benedict Biscop four hundred years earlier. So at Köln the gap in architectural effect between the Apostles' Church and the cathedral seems a gap of ages. But the real chronological gap is not very great. Save a small part of the west end, no part of the Apostles' Church is older than 1199; the work was still unfinished in 1222, and the metropolitan church, a distinct advance alike upon Salisbury and Amiens, was begun in 1248. In short, the fully developed Gothic style seems in Germany to come in quite suddenly. There is nothing like that gradual growth which any one may trace who walks from one end of Romsey Abbey to another.

Dr. Whewell long ago pointed out some of the main differences between German Romanesque and our Norman style in England. He pointed out especially the absence of the huge round piers which are so distinctively an English fashion, and the rarity of many of the mouldings and other enrichments with which we are familiar in our own buildings. But his view was throughout constructive rather than historical. Thomas Hope had before him, though going rather too far in speaking of German architecture as "Lombard," fully caught the true connection between the styles of Italy and of Germany. Mr. Petit again, in that careless kind of way in which he let drop so many acute remarks for other people to work out more fully, saw the connection between the German style and the few remains of Primitive Romanesque, the so-called "Anglo-Saxon" buildings in England. Putting all this together, we can get at a very fair historical view of the style. The Primitive Romanesque, which was cut short in Aquitaine, France, and England, in the course of the eleventh century, lived on and flourished in Germany till the end of the twelfth. The characteristic external feature of the style, the tall, square, hard, unbuttressed bell-towers with midwall shafts, which spread from Italy over all Western lands, has left among ourselves only a few small and rude examples. In Germany it went on through the whole period of Romanesque, and even, as in Italy, greatly influenced the towers of the period which came after. But it was used in Germany in a way which was never thought of in Italy. The campanile of Italy is essentially a detached tower; if it does just touch the church, it hardly ever really forms part of it; such an outline as that of S. Ambrose at Milan, the two western towers and the central cupola, must be nearly unique. The German architects seized on the two great Italian features, the campanile and the central cupola, and worked them together into forms which were unknown anywhere else, and which certainly produced the most varied and picturesque buildings in the world. The Norman architects undoubtedly borrowed their central lanterns from the Italian cupolas, but they always preferred the square form to the octagon, and they at most gave it two satellites in the form of towers at the west end. But the Germans delighted in the octagonal form; they delighted also in bringing the two elements—the tower, commonly square, but sometimes round or octagonal, and the cupola—into the closest possible neighbourhood. The German architect attained his object when he placed an apse immediately against a transept broken by a central tower or cupola, and further flanked his apse with two towers such as English or Norman practice would have placed at the west end as part of a front. But this was not all; the typical German church has nothing that can be called a front; it has, so to speak, two east ends; as there is within both an eastern and a western choir, so there is without an eastern and a western apse, each having, in the most perfect examples, its own transept, its own cupola, its own central tower. There is thus at each end a group which, taken by itself, would be highly picturesque, and the combination of the two, as we see it in the great Rhenish minsters of Mainz and Worms, and in the Abbey of Laach, certainly surpasses every other kind of building in varied and picturesque effect. Of course, such a form is far from universal. Many churches leave out the western apse and nave and front of the English or Norman type. Others leave out the cupolas, and have simply a pair of towers at each end, whether flanking apses or not. In others, as in the Apostles' Church at Köln, the east end has its full allowance of apse, cupolas, and towers, while a single huge tower occupies the west end. In short, it is hard to find two churches exactly alike; but from the single tower of Schaffhausen to the seven towers of Limburg, the German churches aim at a picturesque grouping which has no parallel elsewhere, and the towers throughout the Romanesque period are of a thoroughly Italian kind. When we remember that the double apse was not unknown in England, we may feel that we see in the German minsters of the twelfth century pretty much what we should have had in contemporary England if the development of our native style had not been checked by the Norman influence which began before the Conquest and became supreme after it.

But if the German churches surpass all others in variety of external outline, they certainly sink below all other finished forms of Romanesque in their treatment of the internal elevations. As Dr. Whewell says, the huge round piers of Southwell and Durham are unknown, and the light columnar pier, though not unknown, is the exception and not the rule. The characteristic pier of Germany, no less than of Aquitaine, is square, and that most commonly with very little relief in the way of attached shafts. The triforium is sometimes designed and used as a gallery; sometimes a blank space, as in so many Italian churches, comes between the nave and the clerestory. And the clerestory often merely consists of isolated windows cut through the wall, with little or no attempt to work them either into a continuous series or to connect them in any way with the stages below. The apses in a German church are often well finished within as well as without, but the nave between them is commonly quite unworthy either of the apses or of its own outside. Notwithstanding all the majesty of Speier and Mainz, their main elevations cannot for a moment compare with Caen or Peterborough.

The features which connect the German buildings with Italy on the one hand, and with the other remains of Primitive Romanesque on the other, of course show themselves mainly in the towers. But they are not wanting in other parts of the buildings. The double splay so common in the windows at once connects them with our own early buildings. And as Primitive Romanesque is so rare elsewhere, it is almost fair to argue backwards, and to infer that, whatever in the German building is unlike our Norman is a vestige of the style once common to Western Europe. Certainly, the earlier the German churches are, the less they are like Norman. In the later buildings, Transitional or nearly so, some of the distinctive features die out, and the difference between German and Norman Romanesque is less strongly marked. The late churches at Köln are less unlike Norman than is S. Patroclus at Soest, or S. Burchard at Würzburgh. But even where the difference is least, it is still very great. The German style is pre-eminently a distinct national variety of Romanesque, an independent offshoot from the common source in Italy, and one which has more in common with the earlier than with the later form of Romanesque in our own island. As such, no style is more worthy of study on the ground of its historic importance, and, seen from the outside, no buildings are more worthy of study on the ground of their intrinsic excellence.

ON THE FORMATION OF STYLE IN ART.

MR. POYNTER, A.R.A., Slade Professor of Fine Art at the University of London, lectured to a crowded audience in the lecture theatre of the New Art Schools at University College on Wednesday afternoon last. This was the inaugural address of the second session of the Slade Fine Art Classes at University College. The lecturer said that in the address which he read on the occasion of the opening of the Schools at the beginning of last session he explained the system of art training in foreign, and especially French, schools, which system placed the artists of those countries on so much higher a level as regarded technical excellence in art than those of our own country. With the amazing facility of execution resulting from that system of training, the French or German artist was enabled to work on canvasses 10ft. or 12ft. square with as little trouble as it cost the artists of our own schools to paint cabinet pictures, preserving that unity of effect and thoroughness of execution which we found to be so difficult of attainment when working on a large scale. That system, which he (Professor Poynter) had introduced into the schools at University College, consisted in working from nature, and in giving the student a limited time for the completion of a study in the most scrupulous and truthful manner possible. This system had been introduced by him to defeat as far as possible that timid and unemphasized kind of work which was the prevailing fault in all of our exhibitions of pictures. This school was as yet in its early days, and it was difficult to say how far it might be successful. The great drawback which he (the Professor) had to encounter, the great obstacle which he had to overcome, was the absence of those traditions which were to be found in long-established academies of art. There were no elder students to whom the younger ones could look as guides, although the greatest help the students of any school could have was to see the elder students, who had been brought up in the traditions of the school, at their work. Those elder students who were at present identified with the school came from other schools, mostly with the view of counteracting certain habits which they had formed. All the students of the new school might be said to be equally inexperienced, and the formation of a good style of art necessarily fell upon the instructors, and this was rather up-hill work at the beginning. He must confess to having felt somewhat shocked each time he had during the vacation looked at the drawings and paintings which had been done for the prizes at the end of the last session. With scarcely an exception, the whole of them were crude, and quite devoid of all that free and intelligent style of drawing which characterised the works of the French schools of art at a very early stage of advancement. It was with the view of encouraging among the students a good style of working that he addressed them on that occasion, his remarks being intended to direct them where to look for examples for imitation. Although he had adopted in the schools there a system of instruction pretty closely following the French, he did not by any means consider, or intend to convey the impression, that the result at which French artists arrived was to be held up for imitation. Much as he admired their technical skill and facility of execution, he did not consider that they made that use of it which should be the aim of the true artist to keep before him. The French school had of late years very much degenerated, and had descended lower and lower into mere realism. It was difficult to say to what depths of the horrible they might yet descend. It would seem impossible for the French artist to conceive of ideal beauty. He copied the letter, but failed to seize the spirit, of antique art. During the last ten years of the Empire the works of French artists had run into every kind of extravagance. These remarks did not refer to the old French school; he was merely speaking of that which for the present was in the ascendant. But their successful and simple method of painting placed them far above us in all the lower branches of the art. Their skill was due almost, if not entirely, to their thorough study of nature, though to a great extent to their wonderful facility and fertility of production. If our facilities in this respect were less than those of the French, we must make up for it by working all the harder, and the practice which we should gain by this means would be worth more than any amount of natural talent misapplied. But love of nature was not enough; they must study the way in which the great masters had studied and interpreted nature. Having, then, no style of their own as a school, they must form a style on some other school, and not by imitating the manner of any particular painter or set of painters. He recommended them to study the works of the Early Italian painters in their representations of the simplest aspects of nature. Giotto's works were admirable studies in this respect, and if the students would visit the National Gallery and study the pictures by the great Italian masters they would find in them alone everything that was required for their guidance in the practice of art. The causes of this distinguishing excellence of the works of the Italian school were particularly two:—Firstly, a love of nature, which enabled them to choose what was lovely for illustration; and, secondly, a love of beauty of workmanship, which seemed never to have failed them. The works of Andrea Montana and Filippo Lippi were especially commended by the lecturer as showing the wonderful perfection and delicacy of touch which characterised the Italian masters. They would also derive much profit from the works of the early French and Flemish painters, such as Van Eyck. He did not mean it to be understood that he wanted them to imitate the special manner of those painters, although they might do much worse than that; but he wanted them rather to work in the untiring spirit of love for nature and art which characterised those masters. He wished that in that college they possessed a few good specimens of painters of a later period, to copy a portrait by Titian or Velasquez being a surer means of forming a good style of painting than all the precept in the world, if done under good direction. He had secured a large number of photographs of the Sistine ceiling of Michael Angelo, and these he had placed in the art library belonging to the classes. The library, though small at present, would, he hoped, become larger. The Sistine ceiling, from its subtle truth to nature, was a most admirable study for the student, and he had come to the conclusion that the study of it, though doubtless very difficult from photographs only, would do more to correct that utter want of style which he had mentioned as the great defect in the drawings of the pupils of this school last year, than the works of any other master that he could put before the students. The library also contained a large collection of prints illustrating all the great pictures of the world since the time of Raffaelle. These would also be of service in acquainting the students with the great works which exist in foreign countries. He had also procured for the art library, in addition to Mrs. Grote's gift, some standard books, such as Vasari's "Lives" and Reynolds's works, which had been transferred from the general library. He had drawn especial attention to the library, because it was just as important for the artist to cultivate his intellect as it was for him to train his hand. The educated and intelligent man was to be recognised at once by his works, and the same might be said of the stupid and ignorant. A man of genius would always produce results that would astonish, if not charm, us. Most of the artists of the so-called realistic school were of this kind. It was no sign of genius to despise the work which has been done before us, but it was a not uncommon form of affectation. He was glad to be able to announce that Professor Burrell Lewis had promised to give some lectures on history and archæology, but these would not take place until the summer term. He had also much pleasure in stating that the Slade Committee had also decided on requiring a certain amount of general knowledge from all students who intended to enter their names for the Slade scholarships; but doubtless those who had to pass such an examination would be able to do so without any special preparation; and even were this not the case, they would find it to their advantage to have to make themselves acquainted with some branch of study of which they were ignorant. The lectures on perspective and anatomy he need hardly direct attention to. In conclusion, the lecturer said that it was not to be inferred, because he limited the time in which students had to complete their drawings, that he did not require them carefully and particularly finished. What he wished was that they should acquire the habit of finishing their studies as highly as possible in a given time. In all cases the time allowed would be sufficient, if rightly used, to turn out good work. It was not given to every one to be a genius, but all could be good workmen. The true artist always, Midas-like, turned everything into gold which he touched. Those who had this gift in any high degree were the great geniuses of the world, and might be counted on the fingers. Nothing would ever make him (the lecturer) believe, and nothing, he hoped, would ever induce the students to think, that it was necessary to work down to the level of the taste of the age. Working down to that level was the true cause of the degeneracy of the art of this time; but it was easy for artists to rise above it if they made up their minds to be influenced neither by their pockets nor by the vulgar criticisms of the ignorant.

SANDSTONE.

IN a recent number of the *Revue Scientifique* there appears a paper presented to the Geological Institute of Vienna by M. Fuchs, on the manner in which sandstone must have been formed. It is well known that what the French call *grès*, and we "grit," is a rock composed of siliceous grains agglomerated into a mass possessing more or less tenacity. Now, the cement which binds them together is not always of the same kind, nor does it exist in the same proportion in every kind. The question examined by M. Fuchs is whether the consolidation of the agglutinated mass was effected immediately, or whether it was the work of time? To justify this inquiry he quotes two cases. On the natural jetty which encircles the port of Messina, on the side of the Straits, there are two large slabs of sandstone, with their edge rounded off, and having diameters varying between 12ft. and 18ft., with a thickness of 10in. or 12in. They are buried under sand and shingle, and are unconnected with each other. Thus, also, recent excavations on the shore adjoining the same port have brought to light, after a depth of 9ft. of pebble and sand, and a bed of gray marl, a solid conglomerate filled with sea-shells of the same kind as those still living in the surrounding waters. Their state of perfect preservation shows that they must have been immediately embedded in a soft sandy mud, otherwise they would have been exposed to destruction. The rapid solidification of the sand M. Fuchs attributes to the encrusting agency of certain algæ. The *Codium bursa*, the *Palmophyllum flabillatum*, and others, are known to agglutinate shells and pebbles so as to form masses the size of a man's fist; whence there is reason to conclude they may make larger agglomerations, such as those of the coast of Messina. The other example adduced by M. Fuchs is a sandstone with crystalline grains, which is plentiful at Lievring, near Vienna. Here the agglutination has been slow, owing to the infiltration of water charged with carbonate of lime. Evidently the solidification of such a mass required a long time, and sandstone may, therefore, be considered as belonging to two different formations.

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THE RATEABLE VALUE OF THE METROPOLIS.

FROM an official return just prepared by the direction of the Hackney District Board of Works, it appears that the rateable value of the various districts and parishes within the metropolitan area is as follows: Marylebone, £1,173,316; S. Pancras, £1,105,836; Lambeth, £770,000; S. George's, Hanover-square, £1,241,180; Islington, £981,156; Shoreditch, £446,420; Paddington, £920,544; Bethnal-green, £275,508; Newington, £280,000; Camberwell, £380,000; S. James's, Westminster, £513,156; Clerkenwell, £264,744; Chelsea, £326,972; Kensington, £816,308; S. Luke's, £243,812; S. George's, Southwark; £175,000; Bermondsey, £234,000; S. George's-in-the-East, £234,000; S. Martin's-in-the-Fields, £300,564; Hamlet of Mile-end Old Town, £255,552; Woolwich, £69,400; Rotherhithe, £126,000; Hampstead, £236,680; Whitechapel, £325,808; Westminster, £457,964; Greenwich, £334,990; Wandsworth, £584,220; Hackney, £570,788; S. Giles's, £318,200; Holborn, £224,407; Strand, £315,524; Fulham, £279,560; Limehouse, £273,424; Poplar, £481,440; S. Saviour's, £194,000; Plumstead, £205,084; Lewisham, £310,000; S. Olave, £141,000. The increase per cent. since 1861 has been at the following rates:—Marylebone, 20·11; S. Pancras, 38·24; Lambeth, 22·44; S. George, Hanover-square, 31·52; Islington, 78·87; Shoreditch, 67·92; Paddington, 74·86; Bethnal-green, 111·40; Newington, 16·66; Camberwell, 52; S. James's, Westminster, 18·92; Clerkenwell, 19·59; Chelsea, 39·54; Kensington, 155·15; S. Luke, 42·11; Southwark, 19·86; Bermondsey, 56; S. George-in-the-East, 20·67; S. Martin-in-the-Fields, 16·21; Mile-end Old Town, 57·37; Woolwich, 34·78 decrease; Rotherhithe, 50·87 increase; Hampstead, 127·23; Whitechapel, 22·60; Westminster, 66·83; Greenwich, 28·69; Wandsworth, 71·12; Hackney, 93·86; S. Giles, 21·97; Holborn, 30·74; Strand, 17·58; Fulham, 109·06; Limehouse, 53·56; Poplar, 76·67; S. Saviour's, 18·29; Plumstead, 85·71; Lewisham, 68·38.

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Glasses and bottles marked with the Imperial "N" are being manufactured wholesale in Paris, for credulous relic hunters. To give them a veracious appearance, their fabricators place them in a violently heated oven, and thus endow them with that calcined look which entitles them to the label of "Glass saved from the Tuileries during the fires of the Commune."

KINGSTON-UPON-HULL CEMETERY COMPETITION.

THE designs for this competition are now on view, and are noticed as follows by the *Eastern Morning News* :—

The number (31) is not so large as might have been reasonably expected, probably owing to the fact that the Board seem undecided whether they will employ the successful architect to carry out the work, at least so writes their clerk in some correspondence that appeared in the BUILDING NEWS [see p. 232, No. 924]. This is to be regretted, for architects ought, of all men in the world, to have the superintendence of the practical production of their brain work. Who, better than the man who designs a work, can carry it out to the satisfaction of the designer and as intended in the designer's mind? But to the 31 designs, which are tabulated as follow :—No. 1. "Necropolis," £1,950—5 drawings, showing double chapels, that is two chapels in one block of building. The Archbishop of York will not consecrate chapels in connection as these are, and in all cemeteries separate chapels are very desirable. The design is mediocre. — No. 2. "F. R. I. B. A." £2,500—three drawings. This set is very unworthy of its motto, surely it is not the work of any Fellow of the Royal Institute of British Architects. The lodge is the only part worth attention, and it is but fairly good.—No 3. Device "Triangle in circle," £1,750—four drawings. Very obscure design—in fact, its architecture is not easily perceivable.—No. 4. "Experientia," £2,400—three drawings. A fair design in good style, and contrasting very favourably with—No. 5. "Kingston-upon-Hull," £2,855 15s.—five drawings, and a wretched affair from beginning to end, drawn with a poker, to judge by the exhibition of lines, and containing an abortion in the shape of a lodge.—No. 6. "Alpha," £1,800—four drawings. This set of drawings, or rather "tracings," &c., deserves especial attention ; as in it, and the alternative designs A, B, and C, Nos. 7, 8, and 9, that accompany it, some of the prettiest work, and at the same time some of the most reprehensible work, is exhibited.—The No. 6, two single chapels, is neat, and a good architectural study ; the plans have but one defect, but that is a serious one. No bier porch is provided. The author of these "competition" drawings is, we think, very experienced in the art of "dazzling." His alternatives are well got-up perspective drawings, without any plans or practical information, and would certainly come to more money than the above estimate, were they to be reduced from the magic atmosphere of water-colour to the plain black and white of a bill of quantities. A is very pretty, B is not good, but C is—that is, for style and get up, but for any useful purpose the admission of perspectives such as these is mere waste. The sooner the rule "That no perspectives shall be admitted into competition, unless they are illustrative of a set of plans, sections, and elevations, that show the building in a straightforward manner," is acted up to, the better for all parties. Nothing is more misleading to the tyro in building than specious coloured views, and the impressions they create are generally illusive. It may be fancy, but we believe we have seen the entrance gates of No. 6 in some price book.—No. 10. "A in circle," £1550, three drawings—No. 11. "B in circle," £1,600, two drawings—No. 12. Device "Red disc in circles," £1,730, six drawings—are better passed over, the last especially being a pretentious mixture, with no single redeeming feature.—No. 13. "Right wrongs nobody," £1,300 or £1,400, three drawings. The design so ably illustrated in these three drawings is really the gem of the collection for architecture and get up, but the estimate is too small. Better pen-and-ink perspective it is vain to desire, and the large double chapels and picturesque lodge are worthy of all praise. The entrance gates are good indeed, and the author must be heartily congratulated on the production of a thoroughly artistic work. It is a great pity that the design is for double chapels, and we are afraid that this defect and the cost that must attend the carrying out of the "picturesque" will spoil the chance of a competitor who really deserves some measure of recognition.—No 14.—"Palmam qui meruit ferat," £950—seven drawings. Suffers from the neighbourhood of the stylish set No. 13. It is a practicable design at a very moderate estimate, showing two neat chapels with bier porches and all necessary arrangements, a lodge, &c., and having a view of each chapel in water-colour.—No. 15. "Truth" £2,900—five drawings—No. 16. "Wenlock" £1,500 — two drawings — No. 17. "Amo" £2,750—two drawings—No. 18. "Spes" no estimates—six drawings, containing a wretched hovel of a lodge, and No. 19, "I strive to win," No. 1 design, £2,537 10s.—five drawings, may be omitted, but No. 20, No. 2 design by the author of No. 19 is much better, though not up to any high standard; having some good elevations, but a heavy outlay, £3,100.—No. 21. "Vectis" £1,250—three drawings, shows very plain double chapels. Gate piers with a massive preponderance of "cap," a very ordinary lodge, and a sheet of genuine carpenters' Gothic details that may possibly have survived the Flood, so beautifully "antique" are they in proportion and style. Nos. 22 and 23, by "Success," £2,211 and £2,711 respectively, do not merit any of their motto. The architectural aptitude displayed is very very small, and the schoolmaster must have been long abroad, for on an elevation the word "Descenters" in large letters met our eye, and as variety is charming, on a plan came "Decenters" to balance the account.—No. 24. "Industria," No. 1 design, £1,500, three drawings, shows double chapels.— No. 25. "Industria," No. 2 design, £1,800, has single chapels, but is very ornate and spotty.—No. 26. "Non verba sed acta," £2,450, three drawings, shows single chapels.—No. 27. "Semper paratus," £2,500—three drawings, and very good ones too, well done in pencil, of nice designs. Only require more height in the spire to be a really good study.—No. 28. Device "Cross in circle," £1,030—three drawings. The design comprises two chapels, &c.—No, 29. "Hope," £1,400—three drawings. In similar style and apparently designed by the same author as No. 13. The remarks made upon that apply equally well to this cleverly drawn set, and again we have double chapels.—No. 30. "Trefoil," No. 1 design, £1,510 or £1,620—six drawings. Double chapels with nothing much to notice, and No. 31, No. 2 design by the same, £2,460, or £2,570—three drawings, double chapels, in much better taste than No. 30, complete the collection. It will be seen from the above list that the designs are very various, both in artistic merit and estimated cost. Some are very good, some are very bad, and the latter predominate, for, as is usual in competitions, many useless wrecks are sent in, and several of the genus "dazzler" make an appearance. In deciding which design to accept, the Board of Health have an unthankful task, but if they strictly adhere to the following maxims we think they will meet with their reward. 1. How much can we afford to spend? 2. The cheapest is not always the best. 3. Will the design suit the site? 4. What does the Archbishop require before he will consecrate? 5. No personal favour to be shown. 6. Employ the successful architect at the usual five per cent. to carry out the works. Many 7's and 8's might be added to the foregoing 6, but they are the main points; and we sincerely trust that this competition, though commenced upon vague data, and "containing no plan of site" in any design may yet answer the purpose of the Board, and close without any heart-burning or recrimination, fruits which too often spring from the English system of trying to buy Art in the cheapest market.

ARTIFICIAL FUEL.

ARTIFICIAL fuel is a seasonable topic when coals are dear and the weather is cold. Mixtures of coal-dust and clay are old-fashioned methods of economising fuel; but chalk is now recommended. A correspondent writes: "We are all alarmed at the price of coal. I wish to tell my fellow men to try chalk. I was once a poor parson and burnt it in my own study. I used first to light a small fire with a little wood and coal, and then carefully heap up knobs of chalk till the grate was nearly full, scattering in a little 'slack,' as they call it in Lancashire, or 'screenings.' This will make a pretty-looking moony fire, not so hot as all coal, but a very good makeshift. The old bellows must be looked up and mended, and more attention given to the state of the fire than usual. The ash is, of course, a capital dressing for the garden. A correspondent of the *Journal of the Society of Arts* says he makes an artificial coal in which, with the exception of the bituminous or oily substances used, the whole of the materials cost nothing—in fact, are objects of refuse, or nuisances, which cost both households and municipal bodies large sums of money to get rid of. Every household can make this 'coal' for itself, or companies can be formed to make it on a large scale to leave daily or weekly to purchasers. The *modus operandi* is as follows :—It will be understood that in burning Nature's coal, it is the bituminous or oily substance that burns, not the gritty or earthy substance, which is left in the form of coke and cinders. Now, I take these cinders, and pounding them, not too fine, but about the size of marbles; I put to them any bituminous or oily substance that will coagulate (oils that will not set in this way will not do), and in this department it may be observed that any animal fat, suet, &c., that is often wasted in a house, will all come in useful. Having added this in a quantity—every one will soon find out how much is required—I add some chopped straw or hay, or any kind of weeds dried, such as straw, grass, thistles, gorse, ferns, thin branches of anything floral, in fact, anything that is combustible, and mix with the cinders, these last being to cause the composition to adhere, and the whole being saturated with the bituminous or oily substances, as much is put on to a piece of waste paper with a piece or two of chip of wood (such as is used for lighting fires) at the bottom and top, and to make in bulk the size of a turf or half a brick, and wrapped up and tied, laid under a moderate pressure for a few days, and then piled up for use. The householder will then find that he has all the materials for lighting a fire in one paper, which ignites immediately, and does not go out, as is the tormenting habit of many fires. One or two turf-sized mixtures will last about three hours, will give out little flame and less smoke, will soon get into a red heat, and will leave a mixture that can be used again. This is not to supersede the use of coal, but to materially lessen the use of it.

BIRKENHEAD SCHOOL OF ART.

THE annual meeting was held on Monday, under the presidency of Mr. J. Laird, M.P., who stated in his address that, so far as the prizes were concerned, the year's work was not so good as in former years. At the annual examination in April last, the total number examined was 95, and out of that number 57 succeeded in passing 81 papers. Of those papers 18 obtained the mark excellent. 132 students had sent 886 works to London. Six prizes were awarded, being only half the number obtained last year, but that was to be accounted for in the changes that had taken place in the pupils. In the national competition, however—which, perhaps, was the most important of all—the pupils had secured one Queen's Prize and one bronze medal, whilst last year they did not secure any of those prizes. The attendance at the morning classes this year was 28, against 26 in 1871. Now, if the young ladies of the district knew the advantages of attending the classes, the committee would not have to complain of an increase of only two in the morning classes. Looking at the position of the building, together with the fact that the school was now in full operation, and was possessed of every appliance, he hoped that next year there would be a different result. In the evening classes there were this year 164 pupils, against 134 in 1871. With regard to the evening classes, great changes have been made. Those classes were composed principally of mechanics, who had now an hour more to spare in the evening than formerly; and if they consulted their future advancement in life, working men could not do better than attend the school of art, by which they might obtain a good education to prepare them for the higher branches of science. He should be sorry if, after an experience of two or three years, the artisans of the place, especially apprentices, did not avail themselves of the instruction of Mr. Bentley, the able master of the school.

MORE ANTIQUARIAN FORGERIES.

SWISS archæologists have been recently discussing the genuine character of William Tell's crossbow, and have apparently arrived at the conclusion that the *long bow* has really been the weapon drawn by those who sung the deeds of that mythical hero. Some profane disbeliever has now ventured to call in question the authenticity of several swords of Edward the Black Prince, dear to the hearts of their respective owners. It appears that a blacksmith near Dorchester has been making fac-similes by the score of the weapon generally supposed to have belonged to his Royal Highness, and that for all that is known to the contrary there may be as many swords of the Black Prince in existence as would arm a cavalry regiment. A daily contemporary suggests that any similar relic—say, for instance, the famous sword "Excalibur"—notwithstanding the testimony of the poet Laureate to the contrary, would be readily forthcoming from Wardour-street if only advertised for. After all, what does it matter? To the many good meaning people who own similar trifles, happily unconscious that hundreds of others possess reproductions equally genuine, we suggest the very old reply of the keeper of a provincial museum to a lady who ventured to doubt the genuineness of a relic in his keeping, "This the skull of Oliver Cromwell!" she exclaimed, "why it's not nearly so large as the one they have at Oxford." "No, ma'am," replied the indignant curator, "it isn't so large, ma'am, but this is his skull when he was a boy!"

CHURCH OF ALL SOULS', GROSVENOR PARK, CAMBERWELL.

THIS church, of which we give an illustration of the north-east view, has been built at the west end of Grosvenor-street, Camberwell-road. It was consecrated at the early part of the present year. The plan consists of a nave and aisles, 85ft. long, chancel 23ft. deep, over which is the tower, with Sacrarium beyond, 12ft. deep, and north and south chancel aisles, 15ft. wide. Sittings are provided for 800 persons on the ground floor. The nave, which is 22ft. wide, is covered with a close boarded roof of trefoil form, with framed principals; the height to its apex is 54ft. Externally, the walls are faced with picked stocks; internally, with white Suffolk bricks. The walling over the nave arches is faced with white terra-cotta blocks stamped with a diapered pattern, especially manufactured by the Whitwick Company, Leicester, for the work. Over each pier is a panel, in which it is intended to place life-size paintings of the Apostles. At present, two only have been executed; these are on tile by Messrs. Harland & Fisher. The organ is placed in a gallery over the north chancel aisle. The tower is 26ft. square and 100ft. high, and is designed to have an octagonal spire. The lower part is open to the choir, the boarded ceiling of which, at a height of 55ft., forms the floor to the belfry. The piers of the nave are of Portland stone; Bath stone is used elsewhere for the dressings. The building has cost £7,800, and the heating and lighting, £340. The architects are Messrs. Henry Jarvis & Son, of Trinity-square, S.E.; the builders, Messrs. Henshaw & Co., of Islington.

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ANCIENT STAINED GLASS IN EXETER CATHEDRAL.

A MOST fortunate discovery, says the *Exeter Gazette*, has been made at the Cathedral. It consists in the finding of an entire clerestory window, precisely similar in character with the very beautiful window still in its place (though sadly mutilated) opposite the Bishop's Throne. Attention was drawn by Mr. Stuart Moore to a quantity of old glass stowed away in the Minstrels' Gallery, and on examination it proved to be the remains of an entire window. The old leading and the principal portions of the glass remain, so that the window can be well restored by a patient and intelligent glass-painter to its original state. This discovery is singularly happy, for it affords convincing proof that the glass of the clerestory of the Cathedral at least (if not also in the aisle windows), was of light and delicate *grisaille*, so free from gaudy colour and dark opaque glass, and so well calculated to heighten the effect and display the exquisite tracery and delicate architecture of the Cathedral. The glass was taken within living memory from the window next but one to that opposite the Bishop's Throne, and it will serve as a most welcome guide to the Chapter in their work of restoration. It shows, too, how in old days the glass-painter was subservient to the architect, and subordinated his work to the beauties of the architect's designs. If all the glass-painters in the kingdom had been asked to furnish designs for these clerestory windows, not one of them would have dared to design such windows as are now proved to have existed. They would have been considered too poor, too colourless, and yet, as we see them, they are the perfection of elegance and grace.

The ancient architect knew that the glass should be subordinate to the building, and not, as modern glass-painters would seem to wish it, that the window (no matter how exquisite the tracery, nor however beautiful the groining of the roof and adjacent stonework) shall be the great object, to be filled with gaudy colours and opaque non-lustrous glass, excluding the light, and concentrating all the attention of the spectator by the gaudiness of the colouring, to the detriment of the architect and the carver, and to the destruction of the general effect of the building—in fact, making the most exquisite window tracery to degenerate into a mere picture frame for gaudy glass. In a church of the eleventh or twelfth centuries, where the architecture is bold and massive, and has few pretensions to artistic grace and elegance, no doubt a very large amount of colour may well be used in the windows, where it has the happy effect of increasing the grandeur of the proportions and the massiveness of the building, at the same time taking away from its cold and sombre effect. We have good authority for such a use of colour in the splendid windows in Canterbury Cathedral, which have happily escaped the flames. But as architecture grew more graceful, so glass grew lighter and brighter, and we come to the Decorated period in architecture, and the *grisaille* period in glass. The architect then wanted no more heavy masses of colour, but light, and brilliant, and soft toned windows, shedding a mellow light upon his beautiful structure of carving and stonework, making it appear even brighter and loftier than of itself it could be. He cast up its delicate pillars, his light *triforium*, the varied tracery of his windows, and his glorious groined roof, all tending reverently upward, like the raised hands of the suppliant, involuntarily uplifting the mind of the beholder, and imbuing him with a sense of reverence and awe in the airiness and loftiness of the beauty of the church of his God. Then the architect wanted no meretricious colour to distract and fix the attention on one subject and divert it from the grandeur of the general effect; but he did want a toning and mellowing of the great flood of light pouring in upon his beautiful roof and arches, and he designed the windows of which it is our good fortune to retain two as guides to the restoration of the others. They have the effect, so cleverly are they designed, of hanging a most beautiful piece of lace-work over the glass, mellowing the light without excluding it, and adding gracefulness and beauty to the building. We are indebted for the discovery to Mr. Frederick Drake, glass-painter, of this city, who is engaged in critically examining the remains of ancient glass in the Cathedral for Archdeacon Freeman, with a view to determine, so far as may be done, what was the character of the original glazing; and we congratulate our indefatigable Archdeacon upon this happy result of his patient and never-ceasing labours for the perfect restoration of the Mother Church of the Diocese.

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THE HOLBORN VALLEY IMPROVEMENTS.

AMONG the local statutes of the late Session was one to authorise additional works in connection with the Holborn Valley and Farringdon Market Improvements. There are two pieces of ground near S. Sepulchre's Church, the keeping of which open and unbuilt upon is desirable and advantageous to the public. It is declared to be just and reasonable that the cost of such public improvements should be borne by the parish and the Corporation.

A sum of £10,723 11s. 3d. stands in the name of the Accountant-General in Chancery to the credit of the parish, and out of it the share of the parish will be paid. Other improvements may be effected, and land taken within three years. By two sections notice is to be given to the labouring classes of land required on which they live, and as to the application of corporate funds. It is enacted that "the Corporation shall, not less than eight weeks before they take in any parish fifteen houses or more occupied either wholly or partially by persons belonging to the labouring classes, as tenants or lodgers, make known their intention to take the same by placards, handbills, or other general notice, placed in public view upon or within a reasonable distance from such houses, and they shall not take any such houses until they have obtained the certificate of a justice that it has been proved to his satisfaction that they have so made known their intention to take the same." The other provision as to proper lodging-houses for the working classes states that "the Corporation may from time to time apply any money or funds belonging to them (not being trust money) in or towards erecting on any lands for the time being belonging to the Corporation, and acquired by them for the purposes of the Holborn Valley Improvements or of this Act, improved dwelling-houses or lodging-houses for mechanics, labourers, and other persons of the working and poorer classes who have been or may be displaced by improvements effected or to be effected by the Corporation, and the Corporation shall let those dwelling-houses when so erected and fitted up in separate sets of rooms or otherwise to such mechanics and labourers and other persons of the working and poorer classes at such weekly or other rents, and on such terms and conditions, as the Corporation from time to time think fit." The City may make additions to the site of Farringdon Market and effect other improvements.

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BURNING OF THE ESCURIAL.

THE *Times* of yesterday morning published the following telegram, dated Madrid, October 2: "The Escurial was struck by lightning to-day. The Pasco le los Reyes caught fire, and the flames instantly spread in the direction of the library, palace, and church. One tower has already fallen. A special train with engines and firemen has left Madrid. Fears are entertained that the whole of the world-famed pile will be destroyed. Great excitement prevails. The King has gone down from Madrid."

CELTIC TUMULI IN EAST KENT.

A CORRESPONDENT of the *Times* writes:—"Two grave-mounds recently explored by Mr. Woodruff, of Walmer, are interesting both from the nature of the interments discovered and from the comparative rarity of Celtic antiquities in that part of the county. These barrows are situated nearly midway between Deal and Dover, about a mile from the sea, on the ridge of a high down, and form conspicuous objects from a great distance. They are about 80 yards apart. The western one, which was first opened, is 72 yards in circumference, slightly oval in form, and 4ft. 6in. at its highest part above the natural soil. About the centre of the mound, and at a depth of 3ft. from the surface, the labourers came upon a deposit of burnt bones, probably a later interment, without any traces of pottery or other remains. Further investigations at a greater depth revealed four large urns, about 3ft. apart from each other. The first that was uncovered stood in a neatly-made niche, with an arched top, cut out of the solid chalk. The bottom of this niche had been carefully levelled, and on it lay a heap of burnt bones, covered by the inverted urn. The three other urns were placed in a similar position in kists formed by cutting cylindrical holes in the chalk to the depth of 18in., but one of them had been crushed by the weight of the superincumbent soil. Within this latter was lying a very small cup of the rudest workmanship. In another, with the burnt bones, were two small vessels, one above the other, of 4in. and 2in. in height respectively. The former resembles in shape, but in shape only, Romano-British ware, and is ornamented with cord-like lines and a chevron pattern; the latter, of elegant form, is perforated with two holes near the bottom, and is of the kind usually described as incense cups. Four small beads were also found among the ashes. The large urns were about 18in. in height, of very imperfectly baked clay, and, unfortunately, with one exception, crumbed in pieces before they could be removed. Two of them were ornamented with incised lines and a chevron pattern, and had small handles on the sides; the others were unornamented. Over the deposit was a layer of brick earth, covered by a layer of flint stones; all the interments were rather to the east of the centre of the mound. The eastern tumulus was next explored, but, after a careful investigation, no traces of sepulture could be discovered. Near the surface was a fragment of an urn covered with a curious and unusual pattern."

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DUST OH!

A REPORT of much interest to householders has just been published by Dr. Corfield, medical officer of health for the parish of Islington. Certain facts which it contains throw considerable light on the causes of one of the most cherished grievances of the householder—the difficulty of procuring the emptying of his dust-bin. Dust, it appears, has "fallen" during the last few years. The extent of its fall may be measured by the fact that, whereas during the year 1866-7 the Islington Vestry received from their dust contractor the sum of £2,200 for the privilege of being allowed to collect the dust, now the case is completely reversed, and the authorities have to pay large sums for the removal of the dust by the contractors. The consequences of this change to the householder are, of course, obvious. Under the former condition of things, the dustmen had neither time nor necessity to seek other means of personal advantage, as it was to their own interest to collect for their employer as many loads as they could in the shortest possible time; and they required, therefore, the smallest possible amount of supervision on the part of the local authorities. Now, however, the work is much more irregularly and inefficiently done.

Owing to the dustmen being much worse paid than they used to be, boys are often engaged on the work instead of men; all being allowed to engage in the practice technically known as "totting"—that is, picking out from the dust any saleable refuse, such as rags, bones, glass, &c. This waste of time did not occur when dust was of value, as the price per load received by the men paid them better; and they were even fined for "totting." The dustmen, Dr. Corfield thinks, are still, perhaps, tolerably attentive to the wealthier localities, and to particular houses where they receive gratuities; but would, if allowed, entirely ignore the poorer districts, which they term "dead pieces." The contractors, being paid a lump sum, naturally try to get off with the smallest amount of work possible. Dr. Corfield, therefore, urges that local authorities should alter the method of contracting, so as to make the profit of the contractors depend upon the quantity removed.

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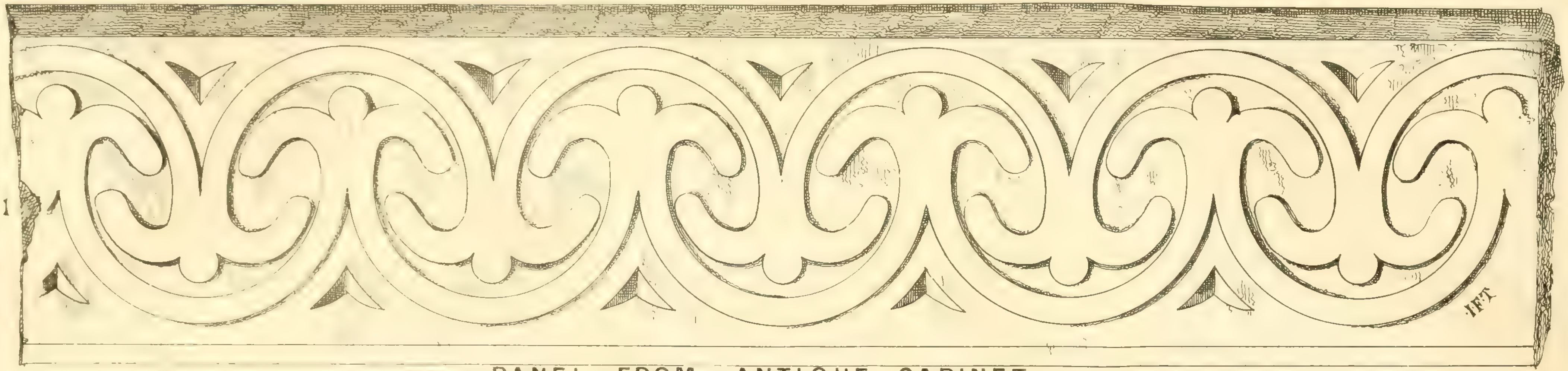

PANEL FROM ANTIQUE CABINET.

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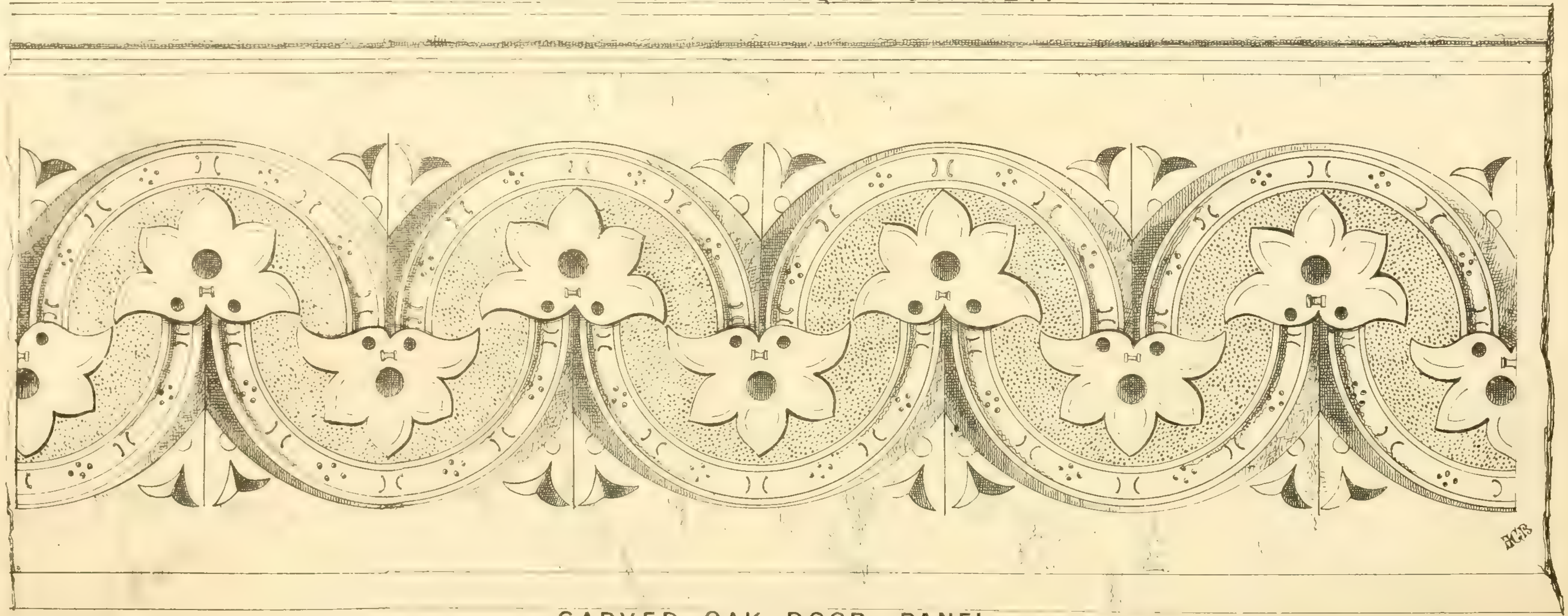
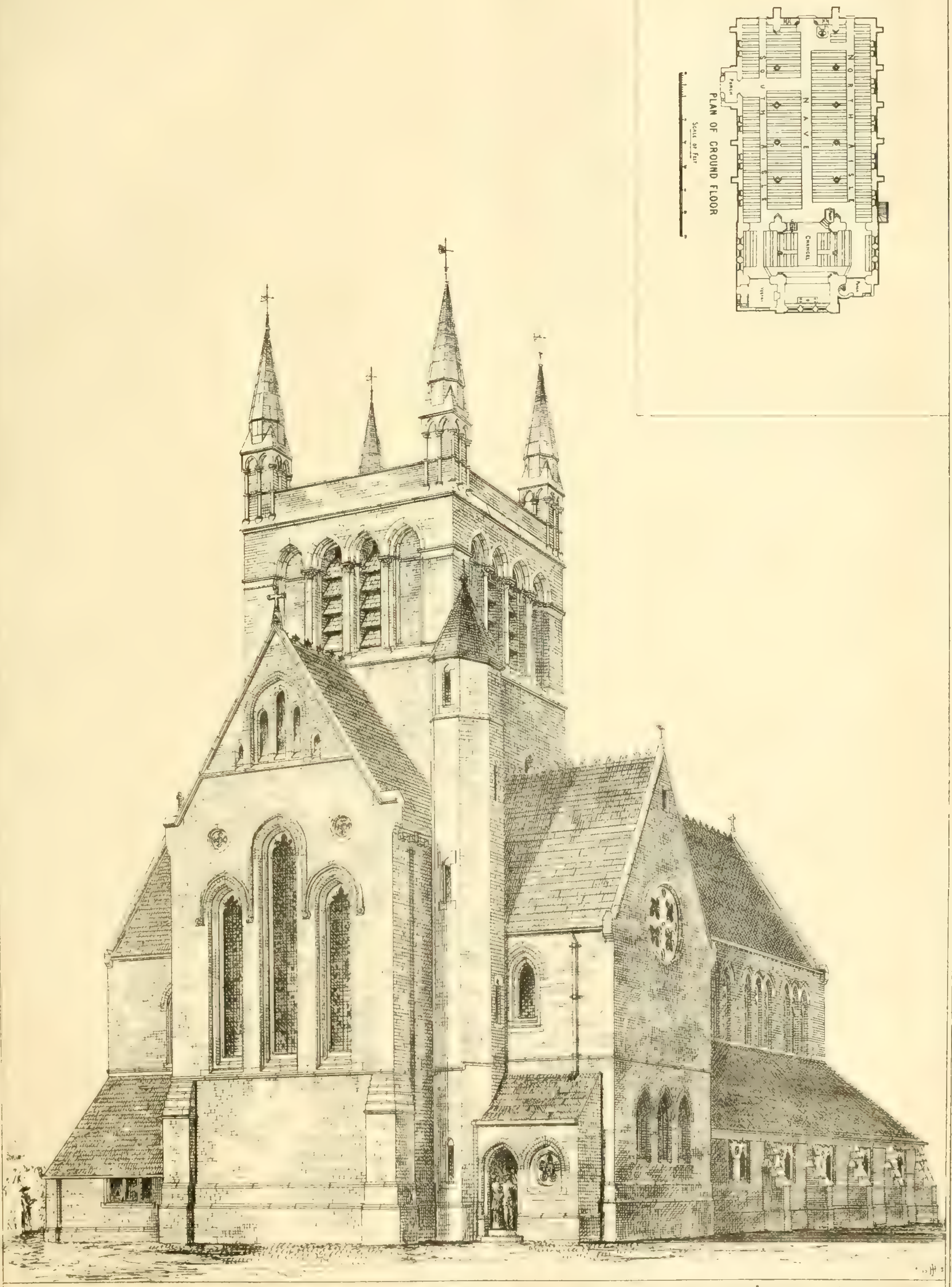


CARVED OAK DOOR PANEL.



: THE · CHURCH · OF · ALL · SOULS · GROSVENOR · PARK · CAMBERWELL · ROAD · HENRY · JARVIS & SON · ARCH TS :

SCULPTURE AT THE PRINCE CONSORT MEMORIAL IN HYDE PARK.

WITH certain unfavourable conditions it would be unreasonable to expect a wholesale increase of our art treasures in the sculpture on the Hyde-park Memorial. The leading motive of the Memorial is based upon a prevailing Art heresy : it provides a predominant architectural structure to which sculpture is attached as subordinate ornament. Moreover, the sculpture, which is required to expound the purpose of the work, speaks without unity, and in con fusion. One portion is symbolic, another is realistic portraiture, a third is allegorical, and a fourth is ornamental and gilded. Sculpture forms the background for sculpture ; straggling figures repeat the architectural idea of clustered columns, and the profusion of statues wearies and distracts the attention of the mind and eye. All this is foreign to the art. Sculpture requires isolation, subdued surroundings, and to be so arranged that the expression of one work will not clash with that of another. Mere architectural images may be clustered as thickly as the stars ; a work of pure sculpture should be as calmly solitary as the one moon with her retiring background.

There is a violence of style in the Memorial. The architectural portion is Victorian-Gothic, the sculpture is Anglo-Greek. No genius can blend the two. The architecture has nothing in keeping with the breadth and repose of the central female figure in Mr. Foley's group of Asia. Intricate and contracted Gothic forms cannot harmonise with the expansive flow and broad ease of line which are the very life of sculpture.

The absence of harmony in colour, and the incongruity of tone, cannot fail to be recognised. The gray marble groups and relievos are cold blots upon the gorgeous brilliancy and depth of the pervading metallic lustre. They are like a mass of Arctic snow upholding a tropical sun. If the relievos upon the base had been mosaic pictures, and in the place of the groups there had been brilliant shrines ablaze with gems and studded with architectural images, the splendour of the structure would have descended and covered the whole site. The effect would have been far more grand, the unity more perfect, and the intention of the Memorial more concentrated.

On the other part, had the sculpture been worthily handled, joined by affinity to architectural forms, and conceived, as it might have been, in its true simplicity and power, the nation would have been less gratified but more deeply touched by the commemorative character of the Memorial. To hope that this could have been accomplished is altogether vain. Such a hope would imply that sculpture was a sister, and not a handmaid, Art; that the popular taste had heroic and not ostentatious aims ; in short, that this had become an artistic nation.

Mr. P. Macdowell, R.A., has contributed the group of "Europe." His conception is a repetition of an old and elegant idea. Four sweet and gentle maidens, representing France, England, Germany, and Italy, are seated round a central figure of Europe sitting upon a bull. The grouping of the figures is treated architecturally, but its geometrical arrangement and balance of parts in no way assist the architectural, while they impair the sculptural, effect. The sweetest of the maidens is Italy, for which the right-hand side of the figure of Europe has been artistically sacrificed to form a background. The other figures lack strength, variety, and intelligence. They are more academic than poetic. The language of the group has altogether too much of the airy ideality of the studio. It is feeble, fanciful, and unreal—not actual, imaginative, or comprehensive. It ignores the masculine power which is the crowning characteristic of the European nations. But it must not be forgotten that the Sculptor, in his vocation, is one of the chief apostles of Peace and gentleness. Mr. Macdowell may have been animated by a desire to show the generous aims of the Prince whom his work commemorates. In that light, making one exception of regret that a more masculine character has not been introduced, Mr. Macdowell's group may be gratefully accepted. Making the same exception, it may also be regarded as a beautiful expression of a national sentiment. This kingdom desires and labours that the great nations of Europe may be found together, as Mr. Macdowell has represented them, dispensing with the sword, and only intent upon culture and the peaceful arts. The execution of the work is neat ; the modelling, with the exception of the right arm of Europe, is chaste. The draperies are, on the whole, excellent. The grouping preserves a unity of intention by the massing together of parts with simplicity and distinctness.

In the group of "Asia," by Mr. J. H. Foley, R.A., the realistic spirit which photography introduced, and pre-Raphaelitism selected, somewhat prevails. But the masculine vigour and training of Mr. Foley's genius carry him, in spite of realistic tendencies, into the higher region of Classic feeling. Poetic grace and power, unity of character, diversity of interest, and robustness of sentiment, pervade his group. In composition, from every point, the pyramidal form and variety of balance with rotundity of mass are maintained. In the front view the breadth is cut up by the unmanageable trunk, tusks, and feet of the elephant in the centre, and also by the draperies, which in this view alone present short broken lines, in parts of the work. The greatest charm of the whole Memorial is the central female figure of Asia. She sits upon a crouching elephant, buoyant and beaming, lifting her veil and disposing her draped limbs with an air of semi-sensuous joy, as though her whole being was filled with the delights of an Eastern Paradise. On her right hand stands a manly, lithe, clean-limbed, Hindoo chief, draped and armed ; at his feet sits a placid Chinaman in his native costume. On the left of the central figure stands a majestic draped Persian in the throes of poetic thought ; at his feet sits a watchful Son of the Desert with his eyes fixed upon the distant horizon. A lofty character pervades the whole work. The figures are not in physical action, but a sense of intellectual activity enamates from them. The faces, hands, and draperies are well carved, without much attempt at handling of surface. The head of the elephant displays carelessness of execution. As a whole, the group expresses the true power, and much of the spirit of the heroic style, of sculpture.

The group of "Africa" is the production of Mr. Theed. A meritorious female figure of Egyptian type, seated upon a kneeling camel, forms the centre of the work. At her right side stands a semi-nude, grand, realistic, figure of a Nubian youth ; upon her left is a kneeling Algerian in his ordinary attire. Behind her is a beautifully-modelled nude figure of a Central African and a draped female allegorical figure. The grouping, in parts, is broken and straggling. The figures are arranged with a fine feeling for continuity of leading lines, picturesquely broken. The rotundity of mass has been too much sacrificed for the rotundity of individual figures. This is apparent in the front view, where the beautiful outlines of the Nubian youth are placed before a gap and partially lost in the confusion of details and broken lines of the draperies of the other figures. This is to be regretted, because the simplest variation in the disposition of the drapery over the right arm of the central figure would have formed a background wherefrom the Nubian would have stood out and done justice to art and the sculptor. At the back the splendid nude figure of the Central African, placed against drapery, shows that in groups of this character a nude figure requires all the adventitious aid of a broad background to produce its proper importance among the sweeping lines of draperies and the attractions of accessory ornaments. The carving of this group is superb. The head of the camel and his trappings, the nude parts, the draperies, and the accessories, are all rendered with a diversity and truthfulness of surface, artistically subservient to the greater merit of form. Mr. Theed may be congratulated that he has done so well.

The group of "America," by Mr. John Bell, is barely satisfactory. Workmen are still engaged upon it, therefore its general unfinished appearance may yet be remedied. The group consists of a central semi-barbaric female figure, seated upon a stooping buffalo ; two other draped female figures, representing the United States and Canada ; and two male figures, seated, representing a partly denuded Spanish settler of South America, and an Old Ranger of the West, also partially denuded. The drawing and proportions of the figures are eccentric. The carving of the faces, the hair, the head of the buffalo, and the draperies, denote such feeling as a mere monumental statuary would display in his work. This bad execution is not the fault of the sculptor ; it is one of the cruel exigencies under which he has had to labour. Marble carvers are extremely rare in this country. The outside public would scarcely credit the infinitesimal number of them available for good work. Evidently, Mr. Bell has had the misfortune of contending against this drawback. He may also, judging from the appearance of the workmanship, have had the further disadvantage of working in a badly-lighted studio. In motive, his chief consideration has been that the group shall tell its story and be understood. Composition has been subject to this consideration. The leading lines are neither continuous nor well balanced ; massive blending of parts has not been sought in the grouping ; and the effect of perplexing shadows, cast from the detached limbs and projecting accessories, has not been considered detrimental to breadth. The figures display vigour and action, not intellectual, but in gesture. The "Fighting Gladiator" of the Greek sculptor has both these qualities. They are not spasmodic, nor the result of mere attitude. They are expressed by the tension of will, the momentary gathering together of all his supreme force before his blow is directed. Upon the realization of this innate effort, and not upon his extended form, the charm of the "Fighting Gladiator" depends. Mr. Bell has not realised that one momentary phase of suspended force which is all that a sculptor can import into figures in motion. Apart from a certain falling short of completing the artistic intentions of his work, he has created a highly intelligent symbolic group, full of speaking accessories and common-sense views.

J. C.

(To be continued.)

MONREALE CATHEDRAL.

EXHIBITING in the South Court of Kensington Museum are a series of drawings illustrating this building, intended for Gravina's work on the structure ; there are shown some remarkable specimens of architectural drawing, in pencil, by one Giuseppe Patricolo d'Polovino, executed with singular fineness and feeling. A drawing of the grand west doorway especially deserves attention, the Byzantine work, with elaborate enrichments and grotesque interwinings, is rendered with faultless precision, and yet with considerable freedom. Draughtsmen will do well to inspect these drawings and emulate the power and skill there displayed. One feels inclined to ask whether an Englishman could draw with such sustained delicacy without falling into stiffness or degenerating into haste and impatience. The hand that traced these drawings must have been quite unhurried and calmly powerful, yet delicate in the extreme, working not for gain or speed, but for the sheer glory of it: for who that knows anything of architectural publication would for a moment suppose it to be lucrative! Details of the doorway are given by the same hand to a larger scale, showing the Romanesque variety of the acanthus leaf; they are drawn upon slightly tinted paper, and have an unobtrusive gray look, giving at first an idea of weakness, but rewarding us upon a closer inspection. We see no forced attempt at effect, though the value of shadow is well observed.

By another artist, in quite a different style, is shown an interior perspective, illuminated in gold and colours; certainly an original way to obtain effect, but not by any means successful. The tie-beams to roof are gorgeous in green and gold, whilst the walls are a very blaze of decoration taken from events in Sacred history. A large, and to our eyes obtrusive, figure of S. Peter is painted upon the apsidal wall; there is not much to imitate here either in architecture or drawing, but the series of sacred subjects, some of them admirably drawn, will repay attention. "Great art must be delicate," but it may be strong nevertheless. We run great risk of allowing our art to be strong without refinement; a study of the works of the Italian artists will help to remedy this, in drawing at least. We hear a good deal of the barbarism of our Gothic, but is it not possible to obtain the spirit and vigour of Mediæval art with the intellectual dignity of the Classic, or must they be always at variance? No style that necessitates a retrograde movement will do for us now. By examining the works of continental artists we learn much, and cannot fail to observe a superior style of drawing, sometimes illustrating very meagre art. As the drawing must largely influence the design, we cannot pay too much attention to its quality. Better fare than that given by brother Giuseppe it would be difficult to find. W. H. L.

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STATUES, MEMORIALS, &c.

Kensington.—A bronze statue of Lord Holland has just been put up on the south side of Holland Park, Kensington, close to the Hammersmith-road. The statue represents Lord Holland sitting in his chair, with his walking staff in his hand, his usual attitude in conversation. The statue has been erected from the residue of a fund subscribed for the erection of his marble monument in Westminster Abbey. Mr. Watts, R.A., and Mr. Boehm, were the sculptors.

Statue of Mr. Cobden.—Mr. G. H. Booth, late of the firm of Firth, Booth & Co., merchants, of Bradford, who is about to retire to America, his native country, has expressed his intention to present to Bradford a full-length statue of the late Richard Cobden. The figure will be produced from the best white Carrara marble, and will be placed in a conspicuous position in the Bradford Exchange. The cost of the statue will be about £1,000.

Scott Monument Completion.—At a meeting of the Committee, held on Friday last, the Lord Provost of Edinburgh in the chair, sketches by the sculptors selected to design statues for the niches of the Scott Monument, were examined, and it was unanimously resolved that the sculptors should be requested to prepare working models half-size of the figures, and submit them for approval to a sub-committee, consisting of Sir George Harvey, P.R.S.A.; James Drummond, R.S.A.; Robert Herdman, R.S.A.; David Cousin, architect; John T. Rochead, architect; and James Ballantine, hon. sec. It was also resolved to employ Mr. Currie, sculptor, Darnick, to execute a statue of Old Mortality, which, with the others commissioned, will complete the old series for the lower, and half the series for the upper niches, on the four great buttresses.

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On Tuesday week the Bishop of Oxford reopened the restored church of S. Giles's, Reading.

Altrincham Town Hall has been recently decorated by Mr. Owen, of Bowdon. The ceiling and cornice is tinted in suitable colours, the cove having stencilled enrichment, centre-piece, and ventilators to match. The upper portion of walls has been panelled in paint with fan-shaped and relieved corner ornaments, and stiles and border of light colours. The lower portion has a rich full dado in deep colours, with upright ornament and decorated band running round the room. The woodwork has been varnished and the moulds picked out in colour. The style of decoration is Neo-Greek.

Building Intelligence.

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CHURCHES AND CHAPELS.

Bath.—A new Baptist Chapel was opened at Bath on Tuesday. Messrs. Willson & Wilcox were the architects. The width of the chapel inside is 37ft. 6in., and the length 74ft. 9in. The height of the building from the basement floor to the ridge of the central roof is 55ft. The height to top of turret from the road is 75ft. The total accommodation is—in the galleries 269, and on the ground floor 362, making a total of 631. Under the chapel is a large and well-lighted school-room, measuring 61ft. 6in. by 37ft. 6in., having three class-rooms adjoining. The style is thirteenth century Gothic.

Bowdon.—Trinity Presbyterian Church, Bowdon, was opened on Sunday week. The church is in the Early English style of architecture. The exterior is built of parpoints from the Burnley quarries, with Hollington stone dressings to windows, doors, and spire. The total length of the church, exclusive of the apsidal end, is 62ft., and the width 42ft., comprising nave and two side aisles. The east end is designed in the form of an apse; on either side are doorways leading to vestry and sessions rooms, which communicate with a large lecture hall, 47ft. by 27ft. This is also approached by an independent doorway, with porch, from the outside. The interior is faced with white malm bricks, relieved with brown brick bands, the several arches being composed of brown and white bricks alternately. The roof is open-timbered to the purlins, on which is formed a flat ceiling. The church has seating accommodation for 400 adults. The coronæ and other ornamental gas-fittings are the work of Messrs. Hart, Son, Peard & Co., of London. The contract has been carried out by Mr. Joseph Thompson, builder, of Bowdon and Manchester, at a cost of something under £5,000, under the superintendence of the architects, Messrs. Speakman, Son, & Hickson (late Speakman & Charlesworth), of Manchester.

Gravesend.—Men have been engaged during the last few days at the foundations of the new tower which is to be erected at the north end of the (Roman) Catholic Church, Gravesend. The work is being carried out by Mr. Blake, builder, of Stone-street, Gravesend. The tower, like the rest of the church, will be in the Gothic style of architecture, and will be terminated by a gable; the height from the ground-line to the top of the gable will be 90ft., and to the top of the cross about 100ft. The tower, which will be 20ft. square, will contain a staircase, baptistry, &c., with the nuns' tribune at the back, and will have a communication with the convent of the Sisters of Mercy. Messrs. Goldie & Child, of Kensington-square, London, are the architects.

Herne.—The completion of the restoration of the chancel of S. Martin's Church, Herne, was celebrated on Thursday, the 19th ult. The finishing work has consisted of the erection of a reredos, a stained glass window, and sanctuary screen. The reredos, composed of stone, alabaster, and marble, is in the Late Decorated period of architecture, introducing under ornate canopies three figured panelled subjects, the centre being that of the Crucifixion, on one side the offering of the bread and wine to Abraham by Melchisedech, and on the other the sacrifice to the lamb, with the twelve Apostles and adoring angels under rich canopied arches above. These are flanked on either side by a rich arcade, introducing the four Evangelists and S. Peter and S. Paul. The stained glass window, which is at the east end, is of the same period as the reredos. There are five main lights, in the centre of which is our Lord, and in the other four are the Evangelists. In the tracery are S. Augustine, S. Thomas, King Ethelbert, and the patron of the church—S. Martin. The new screen is to a great extent a restoration, there being traces of an old screen having occupied the position of the new one. The entire works have been designed and executed by Messrs. Goldie & Child, architects, of 10, Kensington-square, London; the window was carried out by Mr. Wailes, of Newcastle; and the reredos and screens by Mr. Earp, of Lambeth.

Hull.—The foundation stone of a new church was laid at Hull on Monday week. Mr. E. Simpson, of Bradford, is the architect. The permanent church will consist of a nave, aisles, and chancel, with vestry and organ chamber. The entrances will be by porches at the west end of the nave and the north-east corner of the north aisle. The nave will be 98ft. 3in. in length, and 29ft. in width; the north and south aisles, 93ft. 8in. by 13ft. 3in.; the chancel, 26ft. 7in. by 24ft.; vestry, 13ft. 6in. by 12ft.; organ chamber, 13ft. 6in. by 8ft. From the floor to the ridge of the roof the height of the building will be 65ft. The architecture will be of plain Early English type, and the structure will be essentially of brick, no stone being introduced except in the columns of the nave arcade. The roof will be of open timber, with arched principals and boarded ceiling; and the seats, calculated to accommodate 846 adults, will be open benches of stained deal. The cost of the building is estimated at £3,413, exclusive of the tower and spire. The contractors for the building are Messrs. Hockney & Liggins, of Hull.

Madeley.—The church of All Saints, Madeley, Salop, has been reopened, after restoration, at a cost of nearly £5,000. The chancel is about 35ft. long by 20ft. wide; the body of the church about 60ft. by 50ft., and it measures about 72ft. across the transepts. The church affords accommodation for about 400 worshippers. The works now about complete principally consist of the rebuilding of the chancel, the erection of an organ chamber, the obliteration of many coats of whitewash from the walls, piers, and arches; the destruction of flat plaster ceilings, western gallery, and high and square pews in the church and chancel; the total renovation of the floors, glass of windows, lead-roof coverings to north and south aisles; and a complete refitting of the interior. The piers on the north side of the nave are Late Norman work, probably built a little before 1150. There is a short length of walling at the east end of the north side of the nave, containing a blocked-up lancet opening, which is of the early part of the thirteenth century. The north wall of the chancel was of the same period, but had been much injured by later insertions. The arches and walls, to their summit, of the north side of the nave are of about the date 1300, and the lower part of the north face of the tower, seen at the west end, is probably of the same date. Then comes the north aisle, which is of fine Decorated work, and was probably built in the reign of Edward III., while its roof is of seventeenth century work. The chancel arch and its north and south windows next followed in point of date late in the fourteenth century; then the tower and south aisle of the fifteenth century; afterwards the north and south transepts at the end of the fifteenth century; and, lastly, the eastern chapel and south porch, the roof of the former being of the date 1642, and the wall of the latter 1696. The chancel has been rebuilt in fourteenth century character. The walls are of coursed stone inside and outside. The stained glass is by Messrs. Clayton & Bell. The windows generally are glazed with cathedral glass in patterns and tints of varied design, executed by Messrs. Heaton, Butler, & Bayne. One two-light window on the north side is of stained glass by Hardman. In the exterior of the building every ancient stone and other material that could be preserved has been left in its place. The architect was Mr. Charles Lynam, of Stoke. The contractor for the general works was Mr. John Stringer, of Sandbach; the decorations have been done by Messrs. Heaton, Butler, & Bayne; the iron and other metal works by Messrs. Hardman & Co.

Newark.—A very fine addition has just been made to the already beautiful parish church of Newark, in the shape of a pair of handsome gates, which have been put up at the north and south entrances to the chancel. They are constructed of oak, ornamented with brass, from designs by Sir Geo. Gilbert Scott. R.A. The cost has been £260.

Stroud.—A large and elaborate reredos has just been erected at Stroud parish church. It is in the Decorated style, and measures 23ft. long by 11ft. high. On each side there are two niches surmounted by crocketed canopies, resting on moulded shafts and bases with carved caps, and rising from a quatrefoil-panelled base; from which rise also panelled shafts, which terminate by crocketed pinnacles into the cornice. The centre of the reredos is much deeper and has three recesses, which are divided by moulded shafts rising above the altar line from bases, and having also carved caps, which are surmounted by crocketed three-arched canopies, and in which are groups of three memorable scenes of our Lord's life; the group on the left represents "The Raising of the Cross," and that on the right "The Descent from the Cross," while that in the centre represents "The Resurrection." On each side of the altar are two arched panels, having moulded bases and shafts with carved caps. All the canopies are cusped, and terminate in foliage. The whole is crowned by a carved and embattled cornice. Sir G. G. Scott is the architect; the three groups have been modelled and executed by Mr. Edward Geflowski, the whole of the architectural part, including the carving, has been executed by Mr. Maurice Geflowski. The cost of it is about £700, which is defrayed by the Stanton family, as a memorial to the late Mr. Wm. Stanton, formerly M.P. for Stroud.

Ugglebarnby.—All Saints' Church, Ugglebarnby, near Whitby, was reopened on Wednesday week, after rebuilding. Before commencing the new church it had been intended to restore the ancient church to something like its twelfth century condition, but on examination it was found that nothing remained to show what the building had formerly been, and that the only traces of an old Norman church were the columns of the chancel arch and a few disjointed stones, all of which have been carefully preserved in the present building. The style of the building is a severe type of Gothic, and the building consists of a massive tower, 14ft. square at the base, which forms the entrance porch or lobby; a nave 42ft. long, 21ft. wide, and 31ft. high, to the ridge, having seven side windows of coupled lancet lights and plate tracery, and a traceried west window. The roof principals are open-framed, each hammer beam being formed of an angel with outspread wings. The chancel is 21ft. long, 16ft. 6in. wide, and 27ft. high to the ridge, the roof being waggon-headed. The several works have been carried out from the designs of Mr. C. Noel Armfield, York Diocesan Surveyor and Architect, Whitby.

West Gorton, Manchester.—The new (Roman) Catholic Church belonging to the Franciscan community at West Gorton, which has been in course of erection for the last six years, was opened yesterday (Thursday) week. The architect is Mr. E. Welby Pugin, and the style adopted is the Geometrical Gothic, of a Continental rather than an English character. The church fronts the old Gorton-lane, is 184ft. in length, and 72ft. in width, and has a height, measuring to the ridge of roof, of 98ft. Externally, it presents a bold appearance, but is plain, being built for the most part of brick, with stone dressings. There are in the west front the most striking external features of the building, three immense buttresses, of which the central one is intended to support an elaborate turret. Beyond the crucifix, with figures of the Virgin and S. John, and on each of the side buttresses an angel with expanded wings, there will be little external ornamentation. The internal decoration, consisting chiefly of carved stonework and sculpture, is the principal feature of the church. The building has been erected under the superintendence of the architect by local contractors, the carving being by Messrs. E. Williams & Millson, of City-road, Manchester.

BUILDINGS.

Antwerp.—The new Exchange at Antwerp was inaugurated last Sunday week by a banquet. The old Antwerp Exchange, said to have been the first known in history—that of London was the second—was built in 1531. It was a building without any upper rooms, and was burned down in 1581. When it was rebuilt, a second story was added, which was used by the merchants for offices. So it remained till it was partially destroyed by fire thirty years ago, and when it was restored a dome of iron and glass was added. It was this structure which was completely burned down on the 2nd of August, 1858. The present building is built on the model of the old Exchange, and the ancient carvings on the granite pillars, and the Gothic style of decoration of the gallery and the tribunes, is closely followed. The roof is considerably higher than that of the old building, and a novel style of decoration is used on the girders which support the roof. They are constructed so as to represent the principal articles of commerce brought to the Antwerp market. On one side is the grape vine, sugar cane, coffee, and rice plants, and on the opposite side are corn, tea, cotton, and tobacco, all cleverly wrought in iron, and coloured to resemble nature.

Glasgow.—To-day is laid the foundation stone of the new asylum for the insane poor of the barony of Glasgow, at Lenzie, and which will, when completed, accommodate 400 persons. The house is in the Elizabethan style of architecture, with oriel windows and gablets in keeping with that order. The frontage towards the south extends to 720ft. A very prominent object in the centre is the chapel, which corresponds in its architectural features with the general character of the building. Leading from the chapel to the main building is a circular covered way, constructed in the form of a greenhouse, in which it is proposed to place plants and flowers. The space enclosed by the covered way, between the chapel and the main building, and which is about 100ft. square, will be set apart as an ornamental recreation ground for the patients. The most elevated portion of the building is immediately behind this ground, and is surmounted by a couple of towers, there being a third tower of exactly similar character erected over the north entrance. The north entrance is the principal one, and it leads into a hall, on one side of which is the reception-room and assistant-surgeon's house, and on the other the Board-room and matron's house. Both of the houses have independent entrances from a corridor, which is lighted at both ends, and gives access on either side to corridors communicating with the patients' apartments. The remainder of the central block, running back the length of the recreation ground, is occupied with the kitchen and necessary adjuncts, a spacious dining-hall, and apartments for the servants and officials. Mr. James Salmon is the architect, and the cost will be about £60,000.

Melbourne.—A Jesuit College is about to be built at Kew, near Melbourne, Australia. The style is Classic, and Mr. T. A. Kelly, of Elizabeth-street, Melbourne, is the architect. The main block consists of a parallelogram, with projecting central and side blocks crowned by dentilled and moulded pediments, and connected by overhanging eaves of a similar character. The wings are connected on the different floors with the central portion by broad verandahs to each floor. The hall runs transversely, and is 12ft. wide, and opening off it are broad corridors running the entire length of the building. At the termination of these corridors the main staircases are carried up in towers which rise to a total height of 100ft., and terminate in a low flat-pointed roof. To the right, on the ground floor, are the play-rooms, class-rooms, and study; while on the left will be found the parlour, private rooms, and refectory, this last 42ft. by 24ft. On the upper floor are the dormitories, infirmaries, lavatories, bath-rooms, and chapel; the larger dormitory is over 60ft. square. The cost will be about £16,000.

Partick.—On Tuesday evening the new Town Hall and Burgh Buildings of Partick were opened. The buildings have a frontage of about 130ft. The Town Hall is in extent 75ft. long, by 50ft. in width, and the ceiling rises to a height of 45ft., the roof being supported by open semicircular iron-bound couples. On the second floor of the eastern wing is the lesser hall, which is 38ft. long by 26ft. in width. The architect of the buildings is Mr. Leiper, West George-street, Glasgow.

Pontypool Road.—The *employés* of the Great Western Railway purpose building for themselves a Mechanics' Institute, from plans by Messrs. Lawrence & Goodman. It will comprise a reading-room 28ft. 6in. by 22ft., a library 22ft. by 11ft., separated by a movable screen, and with a small gallery over; these can be thrown into one to form a lecture-room, the platform being in an apse at the end. The entrance will be by an arcaded porch 19ft. by 7ft., with a circular staircase leading to the gallery; this staircase will form a turret with a slated spirelet roof. The cost will be about £600.

Stockport.—The foundation stone of a new Institution for the Blind, the Deaf, and the Dumb, has been laid. It is to cost over £3,000. It will be in the Italian style, will consist of three floors, and will have a stone frontage. Accommodation will be provided for from 60 to 100 non-resident patients. The architect is Mr. T. H. Allen, of Stockport; the contractor, Mr. Adam Goddard, builder, Stockport; sub-contractors—for the stonework, are Messrs. Hulme Brothers, Stockport; and for the brickwork, Mr. H. Barlow, Stockport.

SCHOOLS.

Easton.—S. Gabriel's new schools, Easton, Bristol, were opened on the 23rd ult. The schools have been built under the auspices of members of the Church of England, and will accommodate 550 children, the total cost of the buildings and fittings being £1,810. Messrs. Wilkins & Son, of Surrey-street, Bristol, were the builders.

Newport School Board.—Mr. Benjamin Lawrence, of the firm of Lawrence & Goodman, architects, Newport, has been appointed architect to the Board, and a new mixed school for 210 children will be commenced forthwith. The plans selected by the Board have been approved by the Education Board, and the buildings will comprise: a schoolroom 50ft. by 24ft., and a class-room 24ft. by 17ft., with a lobby 24ft. by 7ft. between them, at the end of which will be a lavatory and an inclined way to the playground in the rear. Beneath the schoolroom will be a covered playground, and there will be a separate entrance by another inclined way from the street to the playground. The building will be plain Domestic Gothic, in brickwork, with Bath stone dressings, and covered with slate.

Norbiton.—New schools in connection with S. Paul's Church, Norbiton, Surrey, were opened on Monday week. The schools, which are Elizabethan in style, will accommodate upwards of 400 children, and have been erected at a cost of £2,200, from a design by Mr. Luck, architect, of Surbiton, Messrs. Todd & Sanders, of Kingston-hill, being the builders.

Portsmouth School Board.—At the last meeting of this Board, held on Thursday, the 26th ult., it was resolved to adopt the following recommendation of the Sites Committee—viz. (1) "That Messrs. Alexander & Henman, of Stockton-on-Tees, conjointly with Messrs. Henman & Harrison, of Bedford-row, London, be appointed to furnish the design and superintend the work for the proposed school in Fratton-street, provided that their plans, having been approved by the Board, are likewise satisfactory to the vendor of the Site and the Education Department. (2) That Messrs. Mileham & Kennedy, of 40, Great Marlboro'-street, conjointly with Messrs. Davis & Emanuel, of Finsbury-Circus, London, be appointed to furnish the design and superintend the work for the proposed school in Kent-street, Portsea, provided that their plans, having been approved by this Board, are satisfactory to the Education Department, and that such appointments be made subject to such conditions and details as may hereafter be resolved by this committee."

Rochdale.—S. Peter's Schools, Newbold, Rochdale, were opened on Wednesday week. The schools comprise separate rooms for boys, girls, and infants, with three class-rooms, kitchen in the basements, heating apparatus, chamber, ample porches, and the usual offices. The rooms are so planned as to fit into one another without loss of space, and are comprised within a single rectangle, without any inconvenient breaks or projections. The accommodation is for 600 children, according to the rules of the Education Department. The schools are substantially built, and owe what effectiveness they possess to the arrangement of the gables, windows, belfry, and other necessary features. Messrs. Medland and Henry Taylor, of Manchester, are the architects of the buildings, which have cost rather more than £2,000.

Stepney Jewish Schools.—On Sunday afternoon last an opening ceremonial took place at the New School Building, 71, Stepney-green, in the presence of the Chief Rabbi, and several leading members of the Jewish Community, and a large number of visitors. The new school is very plain, but substantial in character. It consists of a two-story building, each story 13ft. clear in height. On the ground floor is a girls' school 34ft. long, and 21ft. wide, and an infants' school 23ft. long, and 21ft. wide, and on the first floor a boys' school 58ft. long and 21ft. wide. Attached to each floor are ranges of Macfarlane's sanitary latrines and lavatories, and the lobbies are fitted with the usual cloak-pegs. The buildings are so placed on the ground as to form a separate playground for girls and infants out of one portion of the site. The school buildings are lighted on three sides by ordinary lifting sashes, and the warming and ventilation are effected on Boyd's principle by open grates placed in the usual fireplace openings, but with fresh air external inlet gratings at back of stove, where the air, coming in contact with the stove, is warmed, and rising, passes through an internal inlet grating along the top of stove into the school-rooms. The vitiated air is drawn out of the rooms up air-flues built in the brickwork close alongside the smoke-flues of fireplaces, and separated from them by a thin iron flue division which, becoming heated by contact with the smoke, causes an upward current in the air-flue, of which it forms the sides. For ventilation in summer, when no fires are lighted, no plan is so simple as opening the windows. The new building will accommodate 280 children in all, and allowing £200 out of the total amount of builder's contract for the work in altering the old house to form master's residence, the cost of the new school building will be about £1,260—viz., £4 10s. per child, exclusive of desks and forms and curtains, or movable partitions, which may perhaps bring the cost up to £5 per child. The construction of the roof is somewhat special in character; it is formed with unusually strong wall plates, so that at any time, if required, it may be raised bodily by a few screw-jacks under the plates, and a new story inserted under it, to carry which the walls have been built sufficiently strong. The architects are Messrs. Davis & Emanuel, of 2, Finsbury-circus, London; and the builders, Messrs. David King & Son, of Mitre-street, Aldgate. At the conclusion of the opening ceremony a handsome silver inkstand was presented in acknowledgment of his able and energetic services, to Mr. Michael Henry, the Honorary Secretary of the Charity, who is also the Editor of the *Jewish Chronicle*.

Sunderland.—At the monthly meeting of the Sunderland School Board, held on Tuesday, the Clerk announced that the first prize in the competition of architects' plans had been awarded to Mr. Middlemiss, of Sunderland; the second to Mr. Ebdy; and the third to Mr. Oliver, of Newcastle.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

Received.—C. L.—T. P. L.—Q.—L. & N.—J. B. & Son. —A. H. W.—J. H. C.—E. W. R.—J. C.—E. B.—W. & Co. —L. & B.—J. N.—J. H.—J. K. J.

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Correspondence.

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OLD OAK CARVED WORK.

To the Editor of the Building News.

Sir,—I have sent you tracings of old oak carved work that I recently met with, and if you think them of sufficient general interest I shall be glad if you can find a place for them in the illustrations of your paper. No. 1 is from an old oak door I recently discovered in one of the old houses here; the pattern is very pretty and quite geometrical. Since I found it I have seen another exactly similar except in the shape of the leaves—it is in one of the pews of Hucknall Church, the burial place of Lord Byron; the execution of the latter is not so good as that of the other one, but they evidently belong to the same period. Part of Hucknall Church belongs to the twelfth century, the Early English period, and the design of the ornament is quite in that style. No. 2 is from an antique cabinet; it was sketched by a friend of mine while in Wales, it being in the inn at the Llawnt, Denbighshire. The same interlacing pattern is also in this one, and although much plainer, is very effective.—I am, &c., H. G. Badenoch.

15, Mansfield-road Nottingham.

[See Lithographic Illustration.—Ed.]

SCHOOL PLANNING COMPETITION.

Sir,—Will you please say in your first issue if the various departments of proposed schools are intended to be connected, so that a general superintendent might have free access through all parts of the building without having to go outside to any of the main doors, or must each department be entirely shut off from the others?

[There is no special intention. The schools are to be designed in conformity with the requirements of the Committee of the Council of Education, as already stated.—Ed.]

I have assumed that the house in cross-street is kept back 5ft. from line of same. Is this correct, as no distance is marked on your plan? [Yes, 5ft.—Ed.]—I am, &c., M.

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The foundation stone of a new Methodist New Connexion Chapel was laid at Millbrook, Stalybridge, on Saturday last. The building will cost £700, and will accommodate 300 persons.

The foundation stone of a new church has been laid at Heene. Messrs. E. Nash & Co., of Brighton, have undertaken the contract, at about £2,000. The style is Gothic, and the edifice will be faced with flint on the outside, and cased with brick on the inside. The west wall is so built that it can be taken down at any time to enlarge the church. The seating accommodation is for 350 people. The nave is 49ft. in the clear—the chancel about 32ft.

Intercommunication.

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QUESTIONS.

[2665.]—**Measuring Chimney Stacks.**—I shall be glad if any of your readers will answer W. May's query. If they will also kindly turn to mine of August 30 (No. 2641) as to the method to be adopted in measuring furnace chimney stacks, I should be greatly pleased with an answer.—R. L. F.

[2666.]—**Shop Fittings.**—Will any reader kindly inform me the publisher's name of any works upon shop and dispensary fittings?—H.

[2667.]—**The Associated Arts' Institute.**—Now that the season is approaching when the various art and architectural societies commence their new sessions, I should like to be informed whether the Associated Arts' Institute is still in existence. Perhaps some reader can tell me; I can find out nothing definite about the Institute, except that it has left Conduit-street. I am told that it removed to University College, Gower-street; is it still located there? I know the society was in a tottering state two years ago, owing to its not receiving the support of those for whom it was established—namely, architects, painters, and sculptors. The idea of the Institute was admirable, and it is to be regretted that it was not carried out. Has the death of its esteemed President, Mr. Richard Westmacott, R.A., caused the society to collapse altogether?—Delta.

REPLIES.

[2656.]—**Puzzolana.**—The following are some details of the manufacture of artificial puzzolana, by the late Sir Charles Pasley, Royal Engineers: The principal difference between the natural stone and an artificial compound of the same substances must evidently be in the more intimate commixture of the ingredients of the former, for it is not probable that a thorough chemical combination exists between the lime and silex, or alumina, since the former earth is readily separable by an acid, leaving the clay in its original natural state. The principle, then, upon which Sir Charles Pasley proceeded was to make as perfect a mixture as possible of his materials—*i.e.*, an exact imitation of the natural stone before calcination, and to deal with it afterwards just in the same way as with the Roman cement. The materials which formed the basis of his artificial puzzolana were: carbonate of lime, 5 parts; clay, 2 parts. To these it was found necessary to add other substances in particular cases, of which mention will be made presently. As success mainly depended upon the proper mixture of the materials, I will detail the precautions requisite in this preliminary operation. The carbonate of lime ($CaOCO_2$), being reduced to a fine powder, is mixed up intimately with the clay, adding sufficient water to render it a stiff paste, such as bricks would be made of; after this the composition is moulded into lumps of the shape of bricks (4in. × 3in. × 2in.), and set to dry. It is then calcined in a lime-kiln, until the (CO_2) carbonic acid is entirely driven off. The composition is now to be ground up, *dry*, into a very fine powder; and this operation requires attention, for the same composition which will make a good and lasting cement when well powdered will not succeed at all when badly ground up. In the state of powder the lime is ready for use, and may be preserved if kept from the contact of air and water. When used, it is merely to be mixed up with water, a greater proportion of liquid being added when the cement is required to harden slowly and less when quick setting is the object; when the quantity of water is very small, or barely enough to make a paste of the powder, a very few minutes suffice to render it quite hard. Sir Charles Pasley employed blue clay, taken from the bed of the Medway, in most of his experiments, and found it preferable to the brown clay, apparently from its containing protoxide of iron in lieu of the peroxide of that metal, which in all cases proved detrimental to the cement. With the brown clay, indeed, it was found advantageous to mix about 2 per cent. of protoxide to make it a good alloy for the lime; and to prevent its conversion to peroxide in the kiln, a further addition of some carbonaceous matter, such as coal-dust, resin, &c., was in all cases found necessary. The superiority of the blue clay may probably be owing to its containing a portion of vegetable carbon diffused throughout it. The proportion of carbonaceous matter added should be from one-fifteenth to one-twentieth the mass. The following are the results of some of the various experiments at Chatham by the late Sir Charles Pasley:—

	Blue clay.	Chalk.	Coal-dust.	Cement.
1.	27	66·3	6·7	very hard and good
2.	27	67·1	6·9	,, ,, ,,
3.	27	65·9	7·1	not quite so good.

4. The same composition, with one-fifteenth part of different oils and resins, also answered very well.

5. Chalk and blue clay, the latter having been previously washed, did not form a good cement, the composition falling to pieces under water.

6. The following substances, when added in the proportion of one-fifteenth the whole mass, restored to the washed clay its hydraulic property—viz., carbonate of soda, carbonate of potash, muriate of soda.

7. Compounds of chalk and pipe-clay would not answer alone; but the above-mentioned saline ingredients, added before calcination, at once conferred upon these cements the property of hardening under water. The proportion in this case, however, needed to be very small—about one-fiftieth.

8. Magnesia had strong hydraulic qualities, becoming excessively hard of itself when immersed in water, after calcination; but it hardened without heat, and with exceeding slowness.

The foregoing memoranda serve to show the facility with which artificial puzzolanas may be formed by calcining together mixtures of clay, lime, and protoxide of iron, with a very small proportion of alkali, where this may not be supposed to exist already in the clay employed. Puzzolana as made from bricks, tiles, and chips of pottery, is simply these materials ground to a very fine powder.—J. T. J.

[2656.]—**Puzzolana.**—Puzzolana is a substance of volcanic origin, consisting mainly of silica and alumina. Much of its silica is, however, in that condition in which it will gelatinise when treated with weak acid, forming what is known as "jelly-silica," in contradistinction to such as remains unacted upon by acid. It is the presence of silica in this form in puzzolana and trass which renders these substances so valuable for admixture with pure or fat limes for the purpose of imparting to them hydraulic properties, the set of such mixtures being due to the formation of double silicates of lime and alumina, insoluble in water. To prepare artificial puzzolana, a clay should be selected containing about 65 per cent of silica, iron, and alumina, and 35 per cent. of carbonate of lime. This clay should then be slowly roasted in heaps, or in a kiln, with small coal, at a low temperature (in order to avoid the fusion of the silica), and subsequently ground to a fine powder. This operation is actually being carried out in Leicestershire by the Patent Selenitic Mortar Company for their selenitic clay.—Gilbert R. Redgrave.

[2660.]—**Cement and Mortar.**—Your correspondent asks so many questions that it would take a long article to answer them all in detail. I think that the failure of the floor may be ascribed to the blowing of the cement. If his coarse *débris* was very dry when the concrete was laid down, the damp from the soil has probably risen into it, and been absorbed by the thin layer of concrete. This has caused certain overburnt particles of cement to swell and lift the entire floor. It is extremely difficult to make a good cement floor, but I may suggest the following precautions:—1. Not to use the cement too fat; 1 of cement to 2 of hoggin is a very extravagant proportion, and in my experience of concrete 1 of cement to 6 of fine gravel makes a better material than when the larger quantity of cement is used. 2. To spread the cement out in a thin layer on a dry floor for two or three weeks before using it in the finishing coat, turning it over from time to time. 3. Not to make the finishing coat too thick; from ¼in. to ⅜in. is quite enough. 4. The concrete should be well wetted before putting on the top coat. 5. 2 parts of sand to 1 of Portland is better than equal proportions. The shelling off of the outer coat in cement-work is almost invariably due to the carelessness of the workman in not wetting sufficiently the old work before applying the new—though sometimes this failure may be traced to the practice of passing the cement through a very fine sieve, which is objectionable unless the cement is well burnt. Portland cement, when not in a position exposed to the heat of the sun, hardens better outside than in a dry place indoors, as the silicates are formed more readily in the presence of moisture. Portland cement may be gauged with common mortar with excellent results. An extremely hard mortar is obtained by using 1 part of Portland, 1 part of ground gray lime, and 6 parts of sharp sand. Selenitic lime, which will carry with advantage 6 parts of sand, is only found to work short when the sand is very clean and sharp—with a loamy pit sand I have not heard a single complaint. The remedy is very simple: use 1 part of burnt ballast or brick rubbish and 5 of sand to 1 part of lime, and the mortar is then extremely fat. I have seen large quantities of burnt ballast used for mortar: when the ballast is well burnt, which is rarely the case, it stands the frost very well, but not even admixture with Portland will save under-burned ballast in the winter. Mortar made with 1 of Portland to 5 of burnt ballast is wonderfully tough and good. Selenitic mortar made with 1 of lime to 6 of burnt ballast is stronger than that made with 4 parts only of sand. From a long series of experiments I am convinced that the use of burnt ballast gives to all kinds of mortar a far better adhesion to the bricks than when sand is employed.—Gilbert R. Redgrave.

[2661.]—**Excluding Draughts.**—I have found the slides manufactured by Greenwood, Arthur-street, City, answer the purpose. See advertisement.—Carpenter.

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The Municipal Council of Rome decided some time since on placing a commemorative tablet on the Villa Medici in Rome, in which Galileo had been imprisoned. The French Government, who own the villa, objected to have such an inscription on the house, and the council are therefore about to erect a plain stone near the villa, with the following inscription:—"In the neighbouring Villa Medici was imprisoned Galileo, guilty of having discovered that the earth revolved round the sun."

The Westminster Board of Works has just carried out at its own expense, aided by a contribution of £150 from the residents in the neighbourhood, a local improvement by the construction of a carriage-way from Birdcage-walk in S. James's Park to Queen's-square, and the demolition of the unsightly railings which have for many years separated Park-street from Queen-square.

STAINED GLASS.

Gravesend.—Three stained glass windows have been presented by Lady Franklin to the S. Andrew's Waterside Mission Church, Gravesend, in memory of the petty officers, seaman, and marines of the "Erebus" and "Terror." Beneath the windows brasses with the names of each of the crew will be placed.

Knaresbro'.—A new window of stained glass has just been placed in the chancel of Trinity Church, Knaresbro'. There are two lights. One representing the "Glorious Company of the Apostles," includes, under a canopy, the figures of SS. Andrew, Peter, James, and John; and the other "The Noble Army of Martyrs," the figures being S. Stephen, S. Alban, S. Cecilia, and Charles I. The window was executed by Messrs. Baguley, of Newcastle.

The New Window for S. Paul's.—A correspondent, writing from Munich, describes the new window just executed for S. Paul's. It is designed by Professor Faustner, the subject being the Marys coming to the tomb of our Lord. The execution has both the faults and the perfections which any one who has seen the windows in Glasgow Cathedral will associate with the Munich school. The colours are much too bright and full, and there is little mystery or poetry in the figures. In the S. Paul's window the tomb is surrounded by a kind of portico or architectural design which not only looks conventional, but also takes too prominent a place as a framework to the picture. This framework, being architectural in its nature, is, of course, gray in its colour, and, so far, would serve very well to throw out the more brilliant colouring of the figures, but there is introduced through it wreaths of palm and red berries which are painted very vividly, and attract attention which ought not to be diverted from the central interest. The composition is good and original. The angel surmounts the tomb, and two female figures are in front, while at the right hand side you see one of the Marys approaching, and at the left the Roman soldier retreating in the distance. But in all this modern glass there seems to be no tone or shading off. The colours are bright and sharp and striking, and come out like the blues and reds in the pictures of Nicholas Poussin and the French school. Possibly time may tone this brilliancy; but the artists seem afraid to use the browns and yellows and neutral tints that are no less beautiful in the windows of S. Gudule than the more positive greens and purples. In the church of S. Maria Hilf at Munich you would probably see the master-pieces of the modern German school of glass painting, and there it is very remarkable what a small part of the window is occupied with the landscape or figure painting that makes each subject. The force of the picture is softened down by the tracery work which surrounds it, so that you are not dazzled and stupefied by all the brilliant colour that overwhelms you in Glasgow Cathedral. It is probable, however, that in the centre of our smoky capital there will be an agent always at work to soften and tone down the colour, whose activity is unknown in the wood-burning cities of the Continent.

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WATER SUPPLY AND SANITARY MATTERS.

Chester.—The drainage works of the city of Chester will shortly be commenced, the Government having approved the schemes and plans of the Corporation, and sanctioned the proposals made for raising the funds which will be required for the purpose.

London Water.—Dr. Frankland, F.R.S., reports that during September all the metropolitan waters were clear and transparent when drawn from the companies' mains. Major Bolton, water examiner to the Board of Trade, reports the state of the Thames at Hampton, Molesey, and Sunbury, where the in-takes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, and East London Companies are situated, to have been very clear and bright during the month ending 15th September, and the state of the river at Ditton (where the Chelsea Company alone now draws its supply) to have been also good. A considerable improvement has been apparent in the quality of the Lambeth Company's water since the opening of the new in-take at Molesey. The Chelsea company is converting the reservoirs at Ditton into filter beds, as recommended.

Margate.—A special meeting of the Town Council was held on Tuesday week, to consider the plans to be submitted to the council in April next with regard to the drainage. Alderman Reeve moved that it was desirable to call in the aid of a professional civil engineer to advise as to the best mode of draining the town. This proposition was seconded by the Mayor. The meeting was ultimately adjourned.

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The Commissioners of the Westminster Baths and Washhouses have, at the instance of the Marquis Townshend, signified their intention of issuing penny tickets in packets of 50, to be purchased by charitable institutions and individuals, and given by them to the very poorest, to whom the present price of a bath is prohibitory.

Our Office Table.

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At Last!—On Tuesday evening, by direction of the Metropolitan Board of Works, the lamps on the river wall of the Victoria Embankment were lighted for the first time. The standards for the lamps have been cast from designs furnished by Mr. Vulliamy, the architect to the Board. The United States Government have determined to erect lamps of the same pattern in front of the Treasury at Washington. The original drawings, the castings, and core boxes of the lamp standards have been lent by the Board to the American Government, in order that the work might be facilitated. The lamps on the Albert Embankment will be lighted shortly.

Opening of New Tramways.—On Tuesday morning a new line of tramway was opened from the Nag's Head, Holloway-road, along Park-road and Camden-road, to the Brecknock Tavern, Camden-road, from which point it is already working to the Euston-road, King's-cross, Camden-town, and Kentish-town. This newly-opened line also forms a junction between the above-mentioned places and the lines to Finsbury-square, Finsbury-park, and the Archway Tavern, at the foot of Highgate-hill, Upper Holloway. By means of the new line there is now a direct line of tramway open from Finsbury-park to the corner of Park-street, Regent's-park. The new line of tramway of the North Metropolitan Company from the Angel, Islington, along the Essex-road and Balls-pond-road to the Dalston Junction Railway station, Kingsland, was also opened for traffic on Tuesday.

Liverpool Architectural and Archæological Society.—The first meeting of the session in connection with the Liverpool Architectural and Archæological Association took place on Wednesday evening, at the Royal Institution, Colquitt-street. The chair was taken by the president of the year, Mr. T. D. Barry, who delivered a long address. Thanks were voted to the president for his address, and prizes for designs for model cottages were awarded to Mr. E. Banner and Mr. W. C. Hardisty.

Eglistone Abbey.—It is stated that Frank Shields, the well-known "Hermit" of Barnard Castle, is to be allowed to take up his residence in a portion of the old lay buildings of the Abbey. Frank has (says the *Darlington and Stockton Times*) a natural regard for objects of antiquity, and under his superintendence no doubt the Abbey will be safe from the desecrations it has lately suffered at the hands of wanton trespassers.

A New Floor Covering.—Kamptulicon and linoleum have to a very large extent superseded the old-fashioned oil-cloth as floor coverings. A new material, however, recently introduced by Messrs. Chiles & Co., called the asphalte floor covering, seems to be superior to anything of the kind yet manufactured. It is softer and warmer than kamptulicon or linoleum, and its inventors claim that its durability is greater. It is a non-conductor of heat, and containing no oil in its composition does not become cold and rigid in winter or hot and subject to blisters in summer. It is rapidly growing in public favour, and is in use in many public offices and institutions, among others the Bank of England.

Oak Palings.—A correspondent of the *Field* having asked how the cleft oak palings so common around London were made and put up, whether the cleaving was done by a lath-axe or not, and whether the wood should be green or dry, our contemporary has made inquiries on the subject, and the following is a reply from a firm engaged in the trade:—"In reply to your inquiry as to the manufacture of oak pales, we have to inform you that it does not matter if the timber is old or green, with this exception—viz., that in cleaving old timber you must take off the whole of the sap which is decayed, whereas in new timber you may work up the whole of the stuff. The tools used are of the same pattern as those used by lath-renders, but of a larger size. The timber ought to be clean butts, from 12in. to 14in. through, to make good pales. The butt is split into eight or twelve pieces, according to the size; then each piece has about 1½in. taken off from the pith, and the pales are then cleft out of it. The black outside edges are then chopped off, and the pales are shaved with a common handshave, so as to make them of neater appearance."

New Value in Coffee.—Roasted coffee (says the *Homœopathic World*) is one of the most powerful means, not only of rendering animal and vegetable effluvia innocuous, but of actually destroying them. A room in which meat in an advanced degree of decomposition had been kept for some time was instantly deprived of all smell on an open coffee roaster being carried through it containing a pound of coffee newly roasted. In another room the effluvium occasioned by the clearing out of a cesspool, so that sulphuretted hydrogen and ammonia could be clearly detected, was completely removed within half a minute on the employment of three ounces of fresh coffee. The best mode of using it as a disinfectant is to dry the raw bean, pound it in a mortar, and then roast the powder on a moderately heated iron plate until it assumes a dark brown hue, when it is ready for use. It must, however, be remembered that the coffee, to be effectual, should be perfectly pure. Adulterated rubbish will only make matters worse.

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CHIPS.

The Vestry of Kensington have agreed to expend £5,000 in the next half year on paving works in the parish, of which sum £2,000 will be required for re-channelling the main thoroughfares.

The rate collectors of the parish of Marylebone have asked for an increase in salary from £265 to £340 per annum. Not to be behindhand, the inspectors of nuisances, road sweepers, scrapers, masons, and paviors' labourers have applied for an increase, the claims in all instances being based upon the increased prices of food and shelter.

Sir Walter and Lady James have offered the people of Jarrow about five acres of land for a recreation ground.

The corner stones of a new Wesleyan Chapel and school were laid on Saturday afternoon at Heaton Moor. The new building, which will cost about £4,200, will have on the ground floor 368 sittings, and in the gallery 96 sittings. At the rear of the chapel will be a school to accommodate about 250 children.

The Wesleyan Chapel at Great Horton was re-opened on Friday last, after enlargement, at a cost of £2,500, providing 300 additional sittings.

Mr. Joseph Kaye, of Harrogate, has been appointed surveyor to the first Local Government Board of Horsforth.

Mr. James J. Lamb, architect and surveyor to the Town Council of Paisley, died on Wednesday week.

The first stone of the London Foresters' Asylum was laid at Bexley Heath on Saturday last. The plan is in the form of the letter ⊟, the centre building consisting of a chapel.

It is proposed to erect a memorial at Malton, Yorks, to the memory of the late Mr. John Scott, the trainer.

The following advertisement is cut from the *Liverpool Mercury*:—"An architect and surveyor, twelve years in private practice, of unusual practical experience, seeks business of any kind, on easy terms. Large family. Age 37.—Address, pro tem, G 17, Mercury-office."

New National schools have recently been completed in Bermondsey for the district of S. Mary Magdalene. Messrs. Gale & Manning were the architects.

On Monday week the foundation stone of New (Roman) Catholic schools was laid at Preston. The cost of the buildings will be £2,500.

The programme for the new term of the Working Men's College, Great Ormond-street, has been issued, and from it we notice that the classes for the study of art will be under the direction of Mr. W. Cave Thomas.

At a meeting of the Greenwich District Board of Works, the other day, it was resolved not to pay a precept for £1,526 issued by the London School Board, as a protest against the expenditure of that body.

The Earl of Rosslyn, Grand Master Mason of Scotland, will lay the foundation stone of the new building for the Watt Institution and School of Arts, in Edinburgh, next week.

A new "Domesday Book" is being prepared by the Government. It will contain the name and address of every landowner worth an acre and upwards, together with the total extent and value of each property, and the parish in which it may be situated.

It is stated that the damage done to Canterbury Cathedral by the recent fire will necessitate an expenditure on the edifice of about £4,000.

In Paris, the new theatre of the Renaissance is being erected with surprising activity. M. Carrier-Belleuse has undertaken the sculpture of two groups of caryatides, which are to flank the principal entrances. The old theatre of the Porte-Saint-Martin had similar figures right and left of the entrance.

The memorial stone of a new Primitive Methodist Chapel was laid at Kingswood on Tuesday. The cost will be £1,000. Mr. Phipps is the builder.

An American merchant in Bradford has signified his intention to present a marble statue of Richard Cobden to the town, to be placed in the Bradford Exchange. The cost is estimated at 1,000 guineas.

Trade News.

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WAGES MOVEMENT.

Aberdeen.—At a meeting of the operative carpenters and joiners, held in Aberdeen on Tuesday night, preliminary steps were taken to approach the employers for an increase of wages.

Birmingham.—An agitation is on foot in Birmingham among the workmen in the chandelier and gasfitting trade for an increase of wages. An association of the workmen has been formed, having about 3,500 members, who have just presented an address to the masters, asking an advance of 15 per cent. on their wages, or 3s. in every pound they earn. Conferences have been held between deputations from the Men's Association and the Masters' Society. It was proposed and seconded by two of the masters that the matters in dispute be referred to arbitration, but this the men refused to agree to. At one of the meetings, a master, Mr. Adkin, said that the firm with which he was connected recently received some capital orders from the Continent, and when the prices were forwarded, answers were sent back that the goods could be had at a cheaper rate on the Continent. The same speaker also stated that all the iron for some works then in progress in Birmingham was to come from Belgium, and was obtained for 20 per cent. less than it could be had for at home.

Hull.—At a meeting held on Friday last, it was unanimously decided that the wages of the operatives (skilled workmen) in Hull be at the rate of 6¾d. per hour. It was also resolved that the working time be 53 hours for 40 weeks summer and 47 hours for 12 weeks winter each year. In consequence of the adoption of the above resolutions the joiners' strike in Hull, which has existed for a period of thirteen weeks, is brought to an amicable termination, and the men have resumed work.

London.—Several additional firms have been struck against in consequence of their refusal to conform to the arrangement entered into between the associated masters and the men. On Thursday week the men in the employ of Messrs. Gillow, of Oxford-street, about thirty in number, struck work. On the Monday morning previous, the firm posted a notice in the joinery shed to the effect that in future the working hours would be from 8 a.m., to 7 p.m. The men at once sent a deputation to the firm, pointing out that those hours were a violation of the hours contained in the agreement between the Master Builders' Association and the men. The firm declined to withdraw the notice, and the only concession they would make was to alter the working hours from 7 a.m. to 6 p.m. Ultimately a settlement was arrived at, and the joiners resumed work on the condition of working 53 hours per week, with the usual time for breakfast and dinner, leaving off at one o'clock on Saturdays. The painters in the employ of Messrs. Watson & Co., Fitzroy-square, have struck, in consequence of the firm having reduced the wages ½d. per hour below the terms agreed upon ; and for the same reason, the carpenters employed upon the out-door jobs of Messrs. Adamson & Son, Turnham-green, have also struck. The men in the employ of Messrs. Morant & Boyd have likewise ceased work. On Wednesday Mr. M'Clymont, whose men are now on strike, was waited upon at his offices by several gentlemen desirous of ascertaining what were the prospects of a speedy settlement of the dispute. The deputation were told that it rested entirely with the men themselves how long the conflict lasted, as the firm was full of hands, and had no intention of receding from the position it had taken up. The reason why the increased wage was withdrawn had not yet been accurately stated. The firm had never objected to pay a mechanic 8½d, an hour, or even more, no matter what branch of the trade he belonged to, providing he was worth the money. On the occasion of the recent arrangement with the Master Builders' Association, the foremen of the various departments were directed to make the halfpenny increase wherever it was deserved. Before, however, a week had elapsed dissatisfaction arose, because all had not been treated alike and placed on one and the same footing. The firm thereupon resolved to return to the old system, and the strike took place solely and simply on account of its refusing to pay good, bad, and indifferent alike. The 52½ hours there was no objection to whatever; but, at the same time, it should be understood the firm did not occupy the position of ordinary builders or contractors who regulated their prices by the ruling or standard wages of the day, but more resembled an independent gentleman employing workmen to build on his own land. No matter what he paid, he could get no more than a certain rent for his houses, and was fully justified in purchasing his labour cheap if he could, without reference to the custom or regulations of the trade. Ten years ago, Mr. M'Clymont added, he and his partner, Mr. Corbett, came into possession of the Redcliffe estate, when they commenced operations with fifty houses, and year by year since had gone on building roads, squares, terraces, and crescents, until the property had arrived at its present state. During that time they had got around them a great body of workmen whom they were now sorry to part with, but whom they had never ceased to classify or pay according to merit and ability. They never had, and never would recognise any hard and fast rule, placing all men on an equality as mechanics, and reducing the highly skilled to the same level as the lesser skilled operative. That being so, Mr. M'Clymont thought the men might have been a little more circumspect in some of their statements; while, as for Mr. Matkin, the carpenters and joiners' secretary, pretending to speak contemptuously of middlemen, he should like to know what would become of the workmen if there were no middlemen in the building trade especially. The men met again yesterday to consider their prospects. Many have found fresh employment in every branch, including twenty-five of the eighty odd carpenters and joiners who came out.

Paisley.—A difference has arisen between Mr. William Gillespie, of Paisley, and a number of men employed by him in the slating trade. Mr. Gillespie has had in his employment several men not connected with the union for a length of time, and he was informed one morning lately that unless he immediately dismissed one of them who had rendered himself obnoxious to the society all the members of it who were working for him would strike. Mr. Gillespie declined to dismiss a good and faithful workman at the dictation of the union, and those connected with it at once left his service. Some four years ago Mr. Gillespie successfully resisted a similar attempt to control his business.

The London Matchmakers.—A combination is about to be entered into by the London manufacturers of vesuvians and lucifer matches with the view of raising the price of these useful articles. They have had a meeting recently for the purpose of forming an amalgamated society, the chief object of which will be to enable the masters to obtain a uniform and better price for their goods, so that they may be in a position to resist strikes.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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TENDERS.

Battersea.—For the reconstruction of the Bridge-road sewer, for the Metropolitan Board of Works. Mr. J. W. Bazalgette, engineer:—

Mee	£1280	0	0
Dunn & Co.	987	0	0
Pearson	978	0	0
Goodyear (accepted)	796	10	0
Haines	497	0	0

Bow.—For the erection of new schools for the London School Board, at Beazley-crescent, Bow. Mr. Keith D. Young, Red Lion-square, architect. Quantities supplied:

Newman & Mann	£8945
Roberts Brothers	8884
Perry Brothers	8804
Ennor	8574
Williams & Son	8270
Kilby	8153
Henning & Son	8120
Dove Brothers	7995
Adamson & Sons	7651
Hill & Sons (accepted)	7548

Brighton.—For the erection of a church at Brighton, for the Rev. D. Wagner. Mr. Somers Clarke, architect. Quantities by Mr. Nunn:—

Purless	£17088
Scrivener & White	16215
Dove Brothers	15755
Baker	15357
Cheeseman	14650
Chapel	13975
Nightingale	13947
Barker	13460
Reynolds	11100

Chelsea.—For an additional boiler, &c., at the Cremorne pumping-station, for the Metropolitan Board of Works. Mr. J. W. Bazalgette, engineer:—

Watts & Co.	£988
Rothwell & Co.	960
Bolt & Sons	889
Anderson & Co.	870
Easton & Amos (accepted)	800

Dulwich.—For the erection of S. Peter's Church, Lordship lane, Dulwich. Messrs. Banks & Barry, architects. Quantities by Mr. J. H. Strudwick:—

Crowland	£10997
Jackson & Shaw	9500
Holland & Hannen	9237
Stimpson & Co.	9170
Ennor	9162
Colls	9150
Perry & Co.	8898
Myers	8721
Patrick	8650
Browne & Robinson	8610
Ashby & Sons	8465
Newman & Mann	8426
Peto Brothers	8397
Dove	8375
Henshaw	8260
Mitchell	7930
Downs & Co. (accepted)	7860

Haggerston.—For alterations and repairs to No. 1, Gloucester street, Haggerston. Messrs. Ebbetts & Cobb, architects:—

Poulson	£216
Paine	159
Ferne (accepted)	145

Haggerston.—For rebuilding Nos. 2 and 3, Gloucester-street, Haggerston, for Mrs. Baker. Messrs. Ebbetts & Cobb, architects:—

Paine	£702
Poulson	580
Ferne (accepted)	475

Hampstead.—For the erection of a dwelling house at Manner's-road, Hampstead, for W. Farquharson, Esq. Messrs. Spalding & Knight, architects:—

Hyde	£1938
Simpson	1822
Boyce	1688
Mann	1639
Temple & Foster	1610
Brass	1570
Wicks & Bangs	1562
Carter & Son	1550
Scrivener & White	1528

Hereford.—For the erection of a new Congregational Chapel at Eign Brook, Hereford. Messrs. Hadden Bros., architects:—

King & Godwin	£2960
Niblett	2954
Lewis	2890
Bowers	2880
Wood & Sons	2750
Welsh & Son (accepted)	2650

Kent.—For additions to Elmstone Court, near Canterbury, for W. J. G. Barrett, Esq. Mr. Richard Martin, architect:—

Bridgman, Nuthall, & West	£2478
Wilson & Son	2290
Jarrett (accepted)	2187

Lincoln.—For the erection of co-operative stores at Lincoln. Messrs. Bellamy & Hardy, Lincoln, architects:—

Chappel	£7500	0	0
Binns	7057	0	0
Martin & Sims	6843	0	0
Hobson & Taylor	6797	0	0
Sharpe	6690	0	0
Close	6647	0	0
Brooks	6598	10	0
Barnes & Wright	6471	0	0
Huddleston & Son	6258	0	0
Kendall	6247	0	0
Young	6225	0	0
Slingsby	5834	0	0

London.—For additions and decorations to Ivy Lodge, Maida Vale. Mr. H. M. Burton, architect. Quantities by Messrs. Corderoy & Sandall:—

Cracknall	£868
Ebbs & Son	775
Nightingale	720
Mitchell	720
Timewell	687

London.—For the erection of a warehouse in Rotherhithe-street, for J. B. Peele, Esq. Mr. G. A. Young, architect, Red Lion-square. Quantities supplied:—

Smith & Co.	£9695
Myers	9520
Dove Brothers	9475
Brass	9440
Jackson & Shaw (accepted)	9160

London.—For new library, &c., to Park House, S. John's Wood Park, for Mr. J. E. Gardner. Mr. Chas. J. Shoppee, architect. Quantities supplied by Mr. Sidney Young:—

Brass	£2329
Conder	2295
Dove Brothers	2195
Jackson & Shaw	2100
Longmire & Burge	2070
Macey	2050

London.—For the erection of a building in Willow-walk, Shoreditch, E.C., for Messrs. Smith, of Queen-street. Mr. R. P. Notley, architect —

McLachlan	£8948
Macey	8620
King & Son	8570
Myers & Sons	8419
Turner & Sons	8374
Newman & Mann	8326
Perry Brothers	8277
Browne & Robinson	8166
Hart	7885
Eaton & Chapman	7660
Morter	7637

London.—For the construction of a new line of sewers to relieve the Fleet Sewer, for the Metropolitan Board of Works. Mr. J. W. Bazalgette, engineer:—

Anderson & Dunmore	£81300
Blomfield & Morris	81000
Mee	79500
Mowlem	75000
Pearson	73000
Ritson	72900
Webster	72500
Broome	69400
Jennings & Co.	66900
Pickering	65999
Nuthall & West	65729
Williams	64500
Noel & Robson	62977
Hall (accepted)	54600

London.—For alterations and partial rebuilding of premises in S. James-street, formerly Crockford's Club House. Mr. C. J. Phipps, F.S.A., Mecklenburgh-square, architect:—

Bracher & Son	£12000
Newman & Mann	11976
Simpson	11897
Gammon & Sons*	11512

* This tender accepted by the architect, but afterwards withdrawn by Messrs. Gammon on the score of insufficiency of time.

Tenders Accepted.

General Builders' Work.	
Simpson (amended tender)	£11300
Iron Work and Rolled Joists.	
Dawnay	720
Scagliola Marble.	
Gaul	368
Kitchen Apparatus and Lifts.	
Jeakes & Co.	830
Sanitory Works and Lavatories, &c.	
Jennings & Son	500
Gaswork and Sunlights (exclusive of fittings).	
Strode & Co.	287
	£14005
Exclusive of Grates, Chimney-pieces, and Decorations	2200

LONDON.—For new wharf at Rotherhithe, for Mr. J. Brandram Peele. Mr. George Adam Young, architect. Quantities supplied by Mr. Sidney Young:—

Smith & Co.	£9695
Myers & Sons	9520
Dove Brothers	9475
Brass	9440
Jackson & Shaw (accepted)	9160

MARLBORO'.—For the erection of the Bradley Memorial Hall, Marlboro' College, Marlboro'. Mr. Street, architect. Quantities by Mr. Poland:—

Dyer	£2694
Williams	2390
Nightingale	1898
Dove Brothers	1875

ROSS.—For new schools and quarters for children, teachers, master and matron; hospital, fever building, tramps and receiving wards at the Ross Union Workhouse. Messrs. Hadden Brothers, architects:—

Goodman & Burmore	£11232
Pearson & Son	10874
Jones & Allen	10436
Bowers	9100
King & Godwin	8557
Welsh & Son	8550
Clutterbuck	8233
Everal (accepted)	7849

STREATHAM.—For alterations to the "King William the Fourth." P. H. Streatham:—

Loat	£920
Parsons	875
Mason (accepted)	797

WALWORTH.—For alterations and additions to the "Prince Regent" tavern, North-street, Walworth. Mr. Frederick Sparrow, architect:

Kellaway (accepted)	£612

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TO ARCHITECTS.

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Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to

MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

CHESTER, October 31.—For plans for the alteration and improvement of S. Paul's Church, Boughton. The architect whose plan is most approved will be employed as the architect of the works, on the usual conditions, and a premium of £20 will be given for the second best.—Rev. H. Falloon, S. Paul's Parsonage, Chester.

DEVIZES, October 9.—For designs and estimates for an Odd Fellows' Hall and Institute.—Mr. W. H. Hill, The Green, Devizes.

THE ROYAL NORTHERN AGRICULTURAL SOCIETY (DWELLINGS FOR AGRICULTURAL LABOURERS), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

ACTON LOCAL BOARD, October 8.—For the supply and delivery of 500 yards of gravel.—E. Monson, C.E., Surveyor to the Board, High-street, Acton.

ADMIRALTY (Whitehall), October 8.—For supplying Her Majesty's Dockyards with iron and wood screws.—Mr. F. W. Rowsell, Superintendent of Contracts.

ADMIRALTY (Whitehall), October 11.—For the supply of wrought-iron hinges to Her Majesty's Dockyards.—Mr. F. W. Rowsell, Superintendent of Contracts.

ADMIRALTY (Whitehall), October 15.—For supplying Her Majesty's Dockyards with ironmongers' sundries.—Mr. F. W. Rowsell, Superintendent of Contracts

ADMIRALTY (Whitehall), October 16.—For the supply of ironmongery and tinware for warrant officers' mess.—F. W. Rowsell, Superintendent of Contracts.

ADMIRALTY, October 16.—For the erection of a coast-guard station at South Kessock, Inverness.—Director of Works Department, Admiralty, Spring-gardens-terrace, S.W.

ADMIRALTY (Whitehall), October 18.—For the supply of wire to Her Majesty's Dockyards.—Mr. F. W. Rowsell, Superintendent of Contracts.

BIRKENHEAD IMPROVEMENT COMMISSIONERS, October 16.—For re-constructing and diverting part of Grange-vale Outfall Sewer.—Mr. Ambrose Udler, Clerk to the Commissioners, Birkenhead.

BIRSTAL LOCAL BOARD (Gasworks), October 10.—For the purchase of gas-tar and ammoniacal liquor.—Mr. J. Smith, Clerk to the Local Board, Gas Office, Birstal.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

BRIXTON RISE.—For the erection of from twelve to twenty six-roomed cottages.—Mr. E. Walker, 9, Haxter-road, Brixton Rise.

BURSLEM, October 7.—For additions to the Nile-street manufactory for Messrs. Pinder & Co.—Mr. Lynaam, Architect, Stoke-upon-Trent.

CARDIFF, October 7.—For the erection of a governor's house at the County Gaol.—Mr. T. Dalton, Clerk of the Peace, Cardiff.

CLONTARF.—For quarrying stone at Howth, and delivering and breaking the same suitable for road making, also for a supply of gravel.—Mr. Thomas Holbrook, Surveyor, 1, Marine-crescent, Clontarf.

COPPENHALL, October 7.—For rebuilding the hearse-house, and fencing a portion of the cemetery.—Mr. F. Cooke, Solicitor, Temple-chambers, Crewe.

COVENTRY, October 7.—For the erection of Spon-street Schools.—Mr. T. H. Kirby, Clerk to the Board, Coventry.

DRIFFIELD SCHOOL BOARD, October 10.—For the erection of schools in Bridlington-road, Driffield.—Mr. H. J. Paull, Architect, 1, S. Peter's-square, Manchester.

EALING, October 8.—For the supply and cartage of granite, clean sifted pit gravel, and broken flints.—Mr. W. Ruston, Clerk, Brentford.

GREAT WESTERN RAILWAY, October 17.—For the supply of Quebec yellow pine.—Mr. F. G. Saunders, Paddington Station, W.

HAMPSTEAD.—For the erection of a villa.—Mr. T. K. Green, Architect, 22, Finsbury-place, E.C.

KIDDERMINSTER SCHOOL BOARD, October 9.—For the erection of new schools for 600 children.—Mr. J. T. Meredith, Church-street, Kidderminster.

LEEDS, October 11.—For the erection of eight houses.—Mr. W. Hall, 7, Bayley-terrace, near Woodhouse-lane, Leeds.

LONDON, October 7.—For the erection of a new chapel on the south side of the Holborn Viaduct.—Messrs. Lockwood & Mawson, Architects, 10, Lincoln's-inn-fields, W. C.

MIDLAND RAILWAY, October 15.—For the erection of a passenger station at Nuneaton.—Engineer's Office, Midland Railway, Derby.

ROAD (Somerset), October 8.—For rebuilding the chancel, erecting two bays to the north aisle, and restorations to the parish church.—Mr. C. E. Davis, F.S.A., 55, Great Pulteney-street, Bath.

S. MARYLEBONE, October 17.—For the construction of about 4,880ft. of brick and pipe sewers, and other works.—W. E. Greenwell, Vestry Clerk, S. Marylebone.

S. THOMAS-THE-APOSTLE (near Exeter), October 9.—For the erection of school buildings.—Mr. J. Champion, Clerk to the School Board, S. Thomas.

SOUTHPORT, October 12.—For the erection of a Presbyterian Church in Lord-street.—Mr. R. Johnston, 225, Lord-street, Southport.

WAR DEPARTMENT CONTRACTS, October 8.—For the performance of works and repairs, and supply of building materials, at Preston.—Commanding Royal Engineer, Royal Engineer Office, Manchester.

WAR DEPARTMENT CONTRACTS, October 10.—For converting old canal store-rooms into four quarters for staff-sergeants at the School of Musketry, Hythe.—Colonel T. B. Collinson, Royal Engineer Office, Archcliff Fort, Dover.

WAR DEPARTMENT CONTRACT, October 11.—For the erection of quarters for clerk and foreman at the New Magazine Establishment at Chattenden, near Chatham.—Colonel J. W. Lovell, Royal Engineer Office, Chatham.

WAR DEPARTMENT CONTRACT, October 15.—For dredging the outer basin at Woolwich.—Major P. H. Scratchley, R.E., Royal Arsenal, Woolwich.

WAR DEPARTMENT CONTRACTS, October 26.—For the performance of works and repairs to War Department buildings and property at Liverpool.—Commanding Royal Engineer, Royal Engineer Office, Manchester.

WEST ASHFORD.—For the enlargement of the workhouse.—Mr. J. Gardner, Architect, Folkestone.

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"REMARKABLE, VERY REMARKABLE INDEED" are the effects of LAMPLOUGH'S PYRETIC SALINE in Preventing and Curing Smallpox, Fevers, and Skin Diseases, Specially refreshing and invigorating during hot weather. Sold by all Chemists, and the Maker, 113, Holborn hill, London.—[ADVT.]

THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 393, published Oct. 4 1872, contains Articles on:—A Five-Pound Slide-Rest and its Capabilities; The Museums of London.—IV.; The Watch, and How to Repair it; Is Electricity Generated by a Current of Water? Cotter's Bow Saw; New Patent Gas; Some Experiments on Vis Viva and Heat; Telescopic Work for Moonlight Evenings; Reviews; An Electric Railway Brake; Astronomical Photography; Mechanism; Pyro-Gilding as Compared with Water-Gilding; Enamelled Medallion Pictures; Recent Patents; Notes of Communications to the Academy of Sciences, Paris; Useful and Scientific Notes; Prismatic Compass—Refraction in Right Ascension and Declination—A Cube to hold a Gallon—Vague Inquiries—Motion of Lunar Perigee—The Earth's Interior—Mean Time—Pressure and Clock-rate—Reiterated Queries—and the Equatoreal; Omicron Cygni; The Star Depths; Bullet Falling and Projected; Interior of the Earth, Laws of Motion &c.; The Laws of Motion; The Planet Jupiter; Ornamental Turning.—XV.; Horological Matters; Theory of Rowing; Mr. Proctor's Maps; On the Details of the Construction of Induction Coils.—II.; The Theory of Rowing; Rent, Interest, and Capital; Theoretical Descent of Man; Concrete; Perspective; English Black v. Ligurian Bees; Cheap Fuel; Adjusting Mainsprings; Wave Power; Some Considerations respecting the Milky Way; Quartz-Crushing Machine; Radius of Surface of Object-Glass; Condensation of Steam in Pipes; Economical Fire-Grates; Stars in Aquilæ; To Pedestrians; Cutter Bar; The Night Glass; Organs—Pneumatic Mechanism; Bell Stop; Knee Swells, and Composition Actions; Road Cylinder; Perspective; The Floor of Plato; Lunar Meteorology; The Moon's Libration; A Curious Fact in Chemistry; Government and Amateur Science.—V.; Ancient Prices of Labour, Commodities. &c., in England; Screw Cutting; Thanks and Compliments; Our Mathematical Column; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents, &c.—Published at the Office of the BUILDING NEWS, 31, Tavistock-street, Covent-garden, W.C.

IMPORTANT SALE OF SURPLUS STOCK,
COMPRISING
GRATES, MARBLE CHIMNEY-PIECES,
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KITCHEN RANGES.

TO BUILDERS, CONTRACTORS, AND OTHERS.

WILLIAM BENNETT
IS NOW OFFERING AT HIS
SHOW ROOMS,
ST. GEORGE'S PLACE, LIME STREET,
LIVERPOOL
(Opposite St, George's Hall and the London and North-Western Railway Station),
AT A
GREAT SACRIFICE FROM PRESENT MARKET VALUE
AN
IMMENSE STOCK
OF
SMOKELESS GRATES, SMOKE-CURER GRATES,
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AND
REGISTER GRATES;
ALSO,
MARBLE AND ENAMELLED SLATE
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Several large rooms have been specially devoted to the display of this SURPLUS STOCK, and all the Goods being marked in plain figures, giving the Present Market Value and Present Selling Prices, show at once to intending purchasers the

IMMENSE SAVING

that may be effected—say 50 PER CENT. as the average.

N.B.—Also, a few really good and useful Second-hand Open and Close FIRE KITCHEN RANGES, STOVES, &c., will be offered at the same time, at very low prices.

St. George's-place, Lime-street, Liverpool,
September 30, 1872.

BUILDERS' BENEVOLENT INSTITUTION.

The TWENTY-FIFTH ANNUAL DINNER in AID of the FUNDS of the CHARITY will be held at Willis's Rooms, S. James's, on Thursday, 7th November, Edwin Lawrence, Esq., President of the Institution, will take the chair. Gentlemen desirous of promoting the interests of the institution by becoming stewards will be pleased to forward their names to the treasurer, Geo. Plucknett, Esq., 258, Gray's inn road, W.C.; or to the secretary, at the office, 4, Vernon-place, Bloomsbury-square, W.C.

A. G. HARRIS, Sec.

September, 1872.

ARCHITECTS' BENEVOLENT SOCIETY.

Patron—A. J. B. Beresford Hope, Esq., M.P.
President—Sydney Smirke, Esq., R.A. Trustees—Professor T. L. Donaldson, Member of the Institute of France; Sir M. Digby Wyatt; George Gilbert Scott, Esq., R.A. Treasurer—Sir William Tite, M.P., F.R.S.

Information relative to the Society may be obtained of the collector, Mr. Alfred Hill, 16, Bancroft Hospital, Mile-End road; or of

JOHN TURNER, Hon. Sec.

15A, Wilton-street, Grosvenor-place.

FORM OF BEQUEST.

I give unto the Treasurer (for the time being) of the Architects' Benevolent Society, the sum of £ , for the benefit of the said Society, the same to be paid out of that part of my personal estate which by law may be effectually given to such a purpose.

CONTRACTS.

To Builders.

TENDERS are required for the ERECTION of a NEW CHAPEL, in London, to be called "The City Temple," to be built on the south side of the Holborn Viaduct. Plans and Specifications may be seen, and Bills of Quantities obtained, at our Offices, from Monday, September 23rd, to Saturday, October 5th, 1872, on payment of a deposit of three guineas, which will be returned on receipt of a bona fide Tender.

Sealed Tenders must be delivered to us, endorsed "Tender for Chapel," not later than Twelve o'clock at Noon on Monday, October 7th.

The Committee do not bind themselves to accept the lowest or any Tender.

LOCKWOOD & MAWSON.

10, Lincoln's Inn-fields, London.

To Masons and Contractors.

TENDERS required for RE-PAVING the Town of Chipping Barnet, Herts, with Yorkshire Stone Paving, also for Granite Curbs, &c. For Quantities and particulars apply in writing to John Ladds, 4, Chapel-street, Bedford-row, London, W.C.

The Local Board will not necessarily accept the lowest or any Tender.

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Advertisements for "Situations Wanted" are inserted in the "Building News" *at a charge of One Shilling for the first Twenty-four Words.*

THE PUBLIC HEALTH ACT, 1872.
CITY OF LINCOLN.

ELECTION of SUB-SURVEYOR.—The Council of the City of Lincoln at a Meeting to be held on the 22nd day of October next, will proceed to the Election of a Sub-Surveyor. He will be required, under the direction of the Surveyor, to discharge all the duties belonging to the office of Surveyor to the Council as a Sanitary Authority under the Public Health Act, 1872; and especially to take charge of, and be responsible for, the due execution of the works of scavenging, &c., which will be carried out by the Council. Salary £150 per annum. The person appointed will be required to devote the whole of his time to the duties of his office.

Candidates must deliver their applications to me, in writing, on or before Saturday, the 19th October. A copy of the bye-laws and resolutions of the Council defining the duties of the Sub-Surveyor may be seen at my office.

H. K. HEBB, Deputy Town Clerk.

Lincoln, 30th September, 1872.

BOROUGH OF SALFORD.

BOROUGH ENGINEER and SURVEYOR.—The Corporation of Salford require the services of a Borough Engineer and Surveyor. He will be required to devote the whole of his time to the duties of his office. Salary £600 a year. A list of the duties may be had from the Town Clerk, Town Hall, Salford. Applications, with Testimonials, endorsed "Application for Engineer and Surveyor," to be sent in on or before Friday, the 11th day of October, 1872. By order,

EDWIN ANDREW, Town Clerk.

Town Hall, Salford, September 24th, 1872.

ENGINEERS.—A Practical Mechanician, in the Stamping Office of the Inland Revenue Department, will be selected by OPEN COMPETITION on October 24. Salary, £200 a year, rising by £20 a year to £300. Persons between 24 and 30 years of age, who have passed with credit through the various branches of a Mechanical Engineer's establishment, will be eligible to compete. Application for the necessary form should be made at once to the Secretary, Civil Service Commission, Cannon-row, Westminster.

CLERK & TIMEKEEPER.—WANTED, a YOUNG MAN who has had some experience in the above capacity, and able to trace drawings and assist in measurements. The work is principally out-door, and on the east coast.—Apply, by letter only, giving particulars of previous employment, to Messrs. H. Lee & Sons, 5, Westminster Chambers, London.

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A PERSPECTIVE DRAUGHTSMAN and DESIGNER, accustomed to the General Work of an Architect's Office wishes an ENGAGEMENT. Terms, 2 guineas a week.—Address, C. W., 147, Stanley-street, S.W.

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N.B.—Fire Policies which expire at Michaelmas must be renewed at the Head Office, or with the Agents, on or before the 14th October.

The Accounts published under the "Life Assurance Company's Act, 1870," and the Company's Prospectus, give the fullest information respecting the state of the Company's affairs, and the terms on which Fire and Life Assurances may be effected.

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TWO COURSES OF LECTURES ON GEOLOGICAL MINERALOGY will be given at KING'S COLLEGE, LONDON, by PROFESSOR TENNANT, to which the Public are admitted on paying the College Fees. One Course is given on Wednesday and Friday mornings, from 9 to 10 o'clock, commencing Wednesday, October 9th, and terminating at Easter, 1873. The other Course is given on Thursday Evenings, from 8 to 9, commencing October 10th.

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UNIVERSITY COLLEGE, LONDON. ARCHITECTURE AND CONSTRUCTION.—Professor T. HAYTER LEWIS, F.S.A., will BEGIN his LECTURES on Tuesday, October 8th. The lectures will be divided into two courses, each of two terms, and will be delivered on Tuesday evenings. Course A on "Fine Art," from 4.30 to 5.30, and Course B on "Construction," from 5.35 to 6.35. Fees for one term, either course, £3 13s. 6d.; for both courses, £6 6s. Fees for both terms, either courses, £6 6s.; both courses, £11 11s. For further particulars, apply to John Robson, Esq., B.A., at the College, Gower-street, W.C.; or at the Professor's Offices, 9, John-street, Adelphi, W.C.

EVENING DRAWING CLASSES, in connection with the South Kensington Museum, will be opened during the coming week in Hoxton, Westminster, Lambeth, Somers-town, Paddington, Marylebone, and Vauxhall, for the study of Architectural and Geometrical Drawing, as well as Building Construction. Fee, for the whole course of seven months, 10s. A large number of valuable prizes are offered; see circular, post-free from the teacher. W. BUSBRIDGE.

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CAUTION.—The CISTERN and other FILTERS adopted by Government for use in the whole of the Royal Navy, the iron-plated troopships, the Indian Barracks, military stores, Abyssinian Army, Light-houses, &c., and recently adopted by the London School Board, are only manufactured by the Patentees and Proprietors, ATKINS & CO., Engineers, 62, Fleet-street, London, E.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 11, 1872.

THE TROPHY OF S. QUENTIN.

TO the seven wonders of the world the Spaniards added another wonder—the huge monastery, palace, and tower known to history and romance as the Escurial. We can well believe that the political differences of Madrid came to a sudden end when the telegraphic announcement reached the capital on Wednesday last week that the world-famed fabric had been struck by lightning and was on fire. It is their proudest monument. Not so ornate as the Alhambra, not so superb as the Sevillian Alcazar, far less beautiful than many another building in the country, its uniqueness gives it a character unapproached by any rival. The Escurial is to the sacerdotal civilisation of Spain what the Tower of London is to the feudal history of England, what Versailles is to the autocratic kingdom of the Louis', and what S. Peter's is to the half-priestly, half-kingly traditions of the Vatican. No other existing structure is comparable with it in point of size complexity, strangeness, gloomy magnificence, and variety of character. The destruction of the great historic pile would have been not only a heavy blow to the Spaniards, but an irreparable loss to Europe. Happily, the building and its priceless contents have not perished, as it was feared they would have—the destruction has been partial only, not complete. The lightning, it appears, struck the frame-work of the principal part of the Collegio, in the Patio de los Reyes, the Court of Kings, and the fire seized the roof of the Library, which is destroyed, along with the Seminary and Lantern Towers. The thousands of rare books and manuscripts and objects of art are, however, saved. The damage done is estimated at £40,000, which King Amadeus, we are told, has generously offered to defray himself. Like so many things that are great in Spain, the Escurial owes its origin to a religious vow. When the tide of battle seemed to be turning against his arms at S. Quentin, Philip II. is said to have invoked the aid of San Lorenzo, whose *fête* day it was, promising him that if Spain were victorious over the French, the Saint should have the most splendid monastery erected to his honour the world had ever seen. The French were beaten, and the King kept his word. Everybody knows that in shape the gigantic edifice bears a fanciful resemblance to a gridiron, the alleged culinary instrument of S. Lawrence's martyrdom thirteen hundred years previously, and the full ecclesiastical title of the "mountain of granite"—"El Real Sitie de San Lorenzo el Real de Escorial"—gives colour to the story.

Placed as it is, in the very centre of a cordillera of colossal mountains, known as the Sierra de Guadarrawa, their stern and rugged nature and difficult approach render the position peculiarly adapted for the purpose originally designed by the royal founder. There is a melancholy grandeur and a desolate sternness in all that surrounds the Escurial, which seems to indicate its fitness for the dwelling of an ascetic monarch, and its equal appropriateness for a royal tomb. It stands some 2,700ft. above the level of the sea, and takes its name from a little village lying at its feet, the distance from Madrid being about twenty-six miles. The structure presents a vast rectangular parallelogram measuring 744ft. from north to south, and 580ft. from east to west. Seventeen ranges of buildings, about 60ft. in height, cross each other at right angles, and thus form four-and-twenty square quadrangles or courts. These courts are mosaic-paved, and are all precisely similar. The marble fountain which occupies the centre of each is an exact repetition of every other. At each corner is a tower 200ft. high, the four representing the up-turned feet of the gridiron, while a range of buildings carried out from one of the sides, and appropriated as a royal residence, corresponds to the handle of the instrument. This latter building is 460ft. in length, and, like the rest, belongs to the Doric order of architecture. The chief attraction of the royal apartments—which, however, are seldom occupied by royalty—are the richly-painted ceilings and the tapestries on the walls. Though these are between three and four hundred years old, they are fresh, bright, and in wonderful preservation. They consist of specimens of French, Flemish, and Spanish manufacture: for each of these countries has had its royal tapestry looms. There are also some fine specimens of painted china vases, and pedestals of handsome proportions, from the royal manufactory of Seville, said to have rivalled that of Sèvres. In the Salle des Gardes, a long, bare-looking, brick-floored corridor at right angles to this wing, are a number of extremely curious mural paintings, representing the victory of John II. over the Moors at Hiqueracla, copies by Fabricio and Granelo of cartoons in the Alcazar at Seville, and also representations of the battle of S. Quentin.

The central structure, around which all this vast aggregate of buildings spreads, is the magnificent temple built after the plan of S. Peter's at Rome. This is the nucleus, as it were, the kernel of the splendid shell. The ground plan is a Greek cross, each limb being 320ft. long and 230ft. wide. The height of the top of the dome is 330ft. The four massive square columns which form the cross and support the cupola have an altar on each side of them. The spandrels of the cupola are covered with frescoes forming a pictorial history of Christianity, and are the work of Luca Giordano. The nave and transepts are equal in width, and are paved with large squares of black and white marble. The steps leading to the high altar are of red marble, and the *retablo* is elaborate in decoration, the panels being filled with pictures. The centre panel represents the martyrdom of S. Lawrence. The shafts of the columns which separate these pictures are of polished jasper, with gilt capitals and bases. "We heard of, but did not see," says the author of "Cosas de Espana," "a magnificent gilt bronze tabernacle, by Jiacome Trezzo, and were told it was the pride of Spain, as being one of the choicest works of art the country contained. It occupied seven years of the life of the ingenious Milanese artist, but was mercilessly destroyed by the French, who finding, contrary to their expectations, that it was not gold, broke it up and threw it away." There are tribunes for the royal family on either side of the high altar, and above these are statue portraits of several kings and queens of Spain; that of Philip II. stands above the small cell whither he was, at his own wish, carried to die in sight of the altar. The church is divided into seven aisles, and contains forty chapels, each with its altar. Over these minor altars are some fine pictures of the Italian and Spanish schools. Of the latter the best are by Navarete, surnamed El Mudo—the Dumb. The proportions of this church, on which all the wealth of Spain was lavished, are not only vast, but in perfect harmony, and it takes away the breath of the beholder from its majestic simplicity. The sacristy is more like a gallery than a room, being upwards of 100ft. long, and only about 24ft. wide, and is painted in compartments by Fabricio and Granelo, the ceiling being richly ornamented in arabesque. All the valuable masterpieces of Raphael, Titian, Tintoretto, and others, which once adorned this apartment, were plundered by the French, as well as all the gold and silver work that could be found. Here, however, may still be seen the famous "Retablo de Sta. Forma," given to the founder of the Escurial by Rudolph II. of Germany. A handsome altar was erected to bear it by Charles II., in 1684. Under the high altar of the church is the royal vault, a costly decorated octagonal chamber, with a fine concave roof, measuring 36ft. wide, and 38ft. high. It is reached by a flight of polished marble steps, the walls being of yellow jasper, panelled out with gilt mouldings. The sides of the tomb, which are of black marble, are fitted with horizontal niches—twenty-six niches in all. In each niche is a porphyry sarcophagus with fluted cover, enriched with gilt mouldings, and raised on gilt feet. Of these sarcophagi sixteen are full, the rest await their occupants. The bodies of kings and of queens *regnant* are buried on the right of the altar, and those of kings' and queens' consorts on the left. Other royal personages are interred in a chapel called the Panteon de los Infantes.

On the other side of the central court of the building stands a magnificent Doric and Ionic entrance to the Patio de los Reyes, and which is reserved exclusively for the admission of royalty, whether in "a state coach or a state hearse." The grand portal is opened twice for every Spanish monarch, first when he is carried to his baptism, and last when he is borne to his grave by three nobles and three monks. The Court of Kings, which is 320ft. long, and 230ft. wide, is adorned with six statues representing the Kings of Judah who were connected with the Temple of Jerusalem. These effigies are remarkable for being cut out of one solid block of granite, although each of them is nearly 20ft. high. The heads and hands are of white marble, and each monarch has a crown of gilt metal. The statues were executed by Montenegro, a native sculptor. In this court alone there are nearly 300 windows; but, like the countless other windows of the place, they resemble deep port-holes of penal and purgatorial aspect rather than avenues of light. It was here, as has been said, where the conflagration broke out, spreading to the great library which is situated above this hall. The library is 195ft. long by 32ft. wide, and 36ft. high. Its vaulted ceiling, now unhappily destroyed, was ornamented with arabesques and colossal figures, by Pellegrino Tiboldi; the bookcases of cedar wood were beautifully carved, with painting in fresco, by Bartolomeo Carducci, emblematical of the several divisions of the works ranged upon the shelves. It is mentioned as a singular circumstance that the books here, having been originally arranged on the shelves with their edges and not their backs to the front, and the titles of the books written thereon, in accordance with an ancient custom, this arrangement is observed to the present day. Previous to the sack of the French, in 1808, the library contained 30,000 printed books, and 4,300 manuscripts, but of which not more than one-half that number now remain. The treasures were chiefly of Arabic literature, the most famous of which was the "Golden Code," containing the four Gospels written on 160 leaves of vellum in letters of gold, and supposed to be of the tenth century. The French, however, have not been the only despoilers of the treasures of the place. In 1671 fire consumed the greater part of it, and swept away no end of the objects of curiosity and art Philip had so laboriously accumulated within it. But there are still many thousands left, among which may be mentioned, in addition to those already enumerated, a white marble life-size Crucifixion on a black cross. This splendid work is attributed to Benvenuto Cellini, and bears his name, with the date 1562. It was the gift of Cosmo de Medici, and on its arrival at Barcelona was carried thence to the Escurial by four bearers on foot, each contributing a shoulder to the burden. Another royal gift is a curious crystal chandelier of the sixteenth century, of enormous size and very elaborate design, suspended from the ceiling of the chapel. The place also possesses 220 colossal volumes, designated as the Libros de Coro, and containing all the church music. These monster books, says the writer to whom we are indebted for much of our information, are kept between two massive stone shelves, fitted with coulisses; and the bindings, of proportionate thickness, are supplied with castors at either end, by means of which they are rolled in and out of their places. The notes of music and the words seemed to have been traced by the hand of some giant on the huge and richly-illuminated sheets of parchment of which the books consist, and might be read with ease from the other extremity of the choir. These books are 300 years old. But to Philip the most precious of its contents, it is said, was the mighty array of saintly relics—no fewer than 7,421 remnants of saints and martyrs, including 11 whole bodies, 300 heads, 600 odd legs and arms, 346 veins and arteries, 1,400 teeth and toes, and last, but not least, a bar of the gridiron on which the patron of the locality was broiled!

It is hardly, perhaps, a matter for surprise that no two accounts of this wonderful pile agree. A bare catalogue of its multitudinous buildings is enough to bewilder the imagination. A royal palace and chapel, it is a monastery with 200 cells, 2 colleges, 3 chapter-houses, three libraries, 15 cloisters, some of which are 212ft. square; 6 dormitories, 3 hospital halls, and 5 infirmaries. It has 8 towers, 1,400 doors, 11,000 windows, in compliment to the virgins of Cologne; 86 staircases; 3,000ft. of fresco paintings decorate its walls, and 89 fountains play in its courts and gardens. There are 120 miles of flooring, and the entire edifice covers upwards of half a million square feet of ground. Juan Bantista of Toledo was the architect of this mighty structure. He did not live to see its completion, however, and his assistant, Juan de Herrera, finished the work. The first stone was laid on S. Lawrence's Day, April 23, 1563. not, as has been asserted, by the architect, but by Philip himself, and the greatest, if not the only pleasure the melancholy monarch ever knew was in watching its progress, and when at the end of twenty-one years it was finished, he passed the remainder of his days within the very gloomiest of its recesses, dying on the anniversary of its completion in 1598. Since the year 1700 it has almost ceased to be the residence of living royalty. The Escurial is estimated to have cost the enormous sum of six million ducats, and is built wholly of gray granitic stone from the rocky desert which its lofty towers overlook.

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SCHOOL BOARD REGULATIONS AND SCHOOL DESIGN.

"THE contemplated use of a building," as the London School Board very properly remark in their instructions to architects, "should always govern its plan." We might go further, and say that the contemplated use of a building should govern its whole design, not merely its arrangement, but its construction and its artistic composition. We use the latter term advisedly. Decoration, strictly so called, may be almost dispensed with in an elementary school: artistic composition is attainable everywhere. Only a small percentage of buildings can or ought to indulge in positive ornament, but all buildings without exception ought to be satisfactory, characteristic, and expressive in their general forms. Taking then, the above-named instructions as a starting point, it may not be uninteresting to inquire what sort of general forms they may be expected naturally to lead to. Will they produce lofty structures or low ones; square blocks or lengthened elevations; straight walls or breaks and recesses; wide roofs or narrow ones? Will they encourage the multiplication of those dreary brick boxes which, for the last century or more, have seemed to the ordinary Englishman the perfection of common sense in building, and which, if not forcibly prevented, he always rejoices to erect everywhere, even under the most opposite conditions, and for the most contradictory purposes? We are inclined to think not. The legitimate tendency of the rules in question is rather towards the picturesque than the formal, and genuine architecture will, we believe, find them a help instead of a hindrance.

The following principles go far towards determining the general character of the works they apply to: 1. The best width for a graded school-room is from 18ft. to 22ft. 2. These should usually be either two or three stories in height. 3. In all cases there should be "through" ventilation. The obvious effect of these principles in combination is to keep the building narrow. But where any large number of children have to be accommodated, there are plain reasons why a *straight* narrow building will be out of the question. To go no further, the length of the site will rarely admit of it; and if it would, the different apartments would be at an inconvenient distance from each other. Consequently, we are almost sure—unless we go out of our way to fight against the natural results of the rules in question—to arrive at a plan with numerous breaks and angles, and a large amount of external wall surface. We reach, in short, an extended arrangement rather than a compact one, as we may always expect to do where we are seeking for a maximum of light and air. An arrangement thus broken up is very favourable to picturesque treatment; so favourable, that by a skilful management of strictly necessary features, we may gain, without ornament, some of the most pleasing effects of architecture. It will, however, be architecture with an individuality of its own. The elementary school, if truthfully and carefully designed, will be in little danger of being mistaken for any other class of building. Its artistic composition will rise out of and emphasize its arrangement, an arrangement which differs so far from that of town structures in general that it ought to be recognisable at first sight by the most uncultivated eye. This is just as it should be. Every work should have an expression of its own, and not be ashamed of looking like what it is. One hears at times the lamentation that architects give all their care to design, and pay no regard to arrangement. In everything, however, that at all deserves the name of architecture, the design springs from, and pours out of, the arrangement. Our Classic predecessors, it is true, had a sort of ready-made exterior, which they called their "design," and were obliged to squeeze their plan into it as well as they could; and the few Classic architects who may still be discovered in an unpetrified condition doubtless do the same. Let them by all means continue the system, and retain a monopoly of it; and let us study their procedure, resting assured that we shall never be far wrong while we carefully reverse it.

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FOUNDATIONS.—III.

PILING.

WHEN foundations are to be laid in ground that contains much water, that is to say, ground that cannot be permanently drained, and when the ground itself consists of fine particles, as silt, sand, or soft clay, the whole mass is more or less fluid, and bearing piles are put down to support the structure. If the ground consists of moderately stiff clay, but which is judged to be not stiff enough for a concrete foundation, its stiffness may be increased by driving short piles in it, whereby it becomes compressed laterally and consolidated. In this case a row of sheet piling should first be driven so as to enclose the whole area to be built upon, and to confine the clay, or the same effect may be produced by driving the outer rows of piles first and working inwards towards the centre; but in adopting this form of foundation it is necessary to proceed with caution, for clay is compressible by weights, but sand is not so, and as silt often consists of a mixture of the two, its compressibility depends on the degree in which it is clayey. In ground containing a large proportion of sand this kind of foundation is not suitable, for when piles are driven into it it is merely shifted, and not consolidated, rising up between the piles if it cannot escape laterally. On this account some people condemn this kind of foundation *in toto*, without reason.

When the immediate ground consists of a soft mass underlaid by a hard stratum sufficient to carry the weight of the structure, and within reach of bearing piles of moderate length, they are, when they consist of timber, driven through the soft ground and rest on or are driven slightly into the hard ground. They then act as pillars, and, as the ground through which they are driven is not sufficiently stiff to afford them lateral support, they are not capable of carrying much weight, because of their tendency to bend, after the manner of all long pillars. The strongest timber pile foundation, is, probably, that in which the ground is moderately stiff or moderately hard, and of considerable depth, allowing long piles to be driven into it, but requiring considerable force to drive them, their bearing power consisting chiefly of the friction between them and the ground, and only partially on that which is due to the area of the base of the pile. In this case they do not act as pillars.

Whichever kind of timber-pile foundation may be adopted, the heads of the piles are cut off to a uniform level, and, if these are below ground, the earth between the rows of piles that has been trodden up by the workmen is removed to a depth of (say) 2ft. below the heads of the piles, and the space filled in with concrete. The heads of the piles are confined together by cap sills laid across them, and across the sills thick planking is laid down, and the foundations of the structure commenced upon that. This is often the practice in heavy works in England, but in Holland, where the ground consists almost wholly of silt and peat of great depth, the foundations of the houses and other structures are laid upon piles over which fascines are spread, and the ground there is so soft that it would hardly be an exaggeration to say that the houses float upon a sea of mud; and yet they stand eminently well. But to suppose, as has been supposed, that the houses in the towns of Holland stand well because of the excellence of their foundations would be an error, for their stability depends chiefly on the excellence of the brickwork of which they are built; the bricks being very small, compared with English bricks, and very hard. These small bricks being put together with good mortar, and very carefully laid, resist any tendency to settlement in parts of a building by reason of the tenacity of the mass of brickwork. The bricks are about the same length and the same width as English bricks, but they are not more than 2in. thick, and often less. The custom in Holland is to drive—but there they do not require much driving—piles of larch or fir trees with the bark on and with the small end downwards, the diameter of the small end being about 6in. and that of the top about 12in. These are not driven down to any hard stratum of ground, but depend for their unyieldingness on the friction between their sides and the ground. The top platform of fascines completes the security that may be wanting in any particular pile. For the same reason we spread a layer of concrete between the pile-heads, and further secure the foundation by laying down a timber platform upon the piles, whereby the weight of the heavier parts of a structure is spread over the whole foundation. For durability beech and elm are preferred for piles that are not wholly buried, for when timber is exposed to alternations of dryness and wetness, as pile-heads sometimes are, the decay of other sorts is in those parts more rapid, but it is difficult to procure either beech or English elm parallel and of a sufficient length for long piles, and then Baltic fir is mostly used, which can be more easily procured long, straight, and parallel, and, as far as is known, it will last as long as any other timber when wholly buried. American rock elm is also an excellent timber for piles, being straight and very sound, and it will bear more driving than fir.

The dead weight that piles will carry is very difficult of calculation. In forcing them into the ground we use the impact of a weight falling from a height, and the force of that blow we ascertain from the laws of dynamics, the weight multiplied into its velocity at the moment of striking the pile being the intensity of the pressure upon it at that moment; but this is an essentially different kind of pressure to that of a statical or dead weight, and there is no exact means of comparing the two kinds of force. To form any just comparison between the effect of the blow of a ram on a pile head and the dead weight it will carry we have to experiment from time to time by driving a pile, and noting exactly the extent of its motion under given circumstances of weight and velocity of the ram, and then by driving a similar pile in exactly similar ground, and weighting it with a dead load; and to arrive at anything like accuracy of results this experiment must be made under each varying condition of size of pile, its weight, load, kind of ground, and manner in which the blows are given; and the latter condition is very important to be considered in all cases where the resistance of the pile to its load depends upon the friction between its sides and the ground with which they are in contact. To drive a pile quickly, and with the least possible force, its vibration must not be allowed to cease during the operation. The blows should, therefore, succeed each other rapidly, as they do in Nasmyth's pile driving machine, which gives about sixty blows in a minute, and, in fact, hurries the pile down, while with a crab engine only one or two blows are usually given in a minute. The jarring produced by the blow on the pile is communicated to the ground in contact with it, and thus the ground is prevented during the time of driving from settling itself about the pile. The friction between the two substances is therefore reduced. But with blows given at long intervals the ground settles itself about the pile after each blow, and the resistance of friction has to be overcome again. Thus the manner in which the pile is driven is important to be taken into account when estimating from the effect of impact what the resistance to a dead weight would be.

The velocity with which the ram strikes the head of the pile is that due to the fall of a heavy body, less the friction of the guides or leaders, which, for great falls, is considerable. Taking moderate falls, and neglecting this resistance and that of the atmosphere, the velocity is proportional to the square root of the height, and if the height be taken in feet, and the velocity in feet per second, it is 8 times the square root of that height; thus, if the fall of the ram be 16ft., its velocity at the moment before striking the pile would be $\surd\ 16\text{ft.} \times 8\text{ft.} = 32\text{ft.}$ per second. If the weight of the same were 1 ton, the momentum of the blow would be 32 tons, or if the weight be 10cwt., the momentum would be 16 tons. There can be no doubt that the proper, and indeed only way to find the momentum of the ram at the moment of striking the pile is to multiply its weight into its velocity, as indicated above, but it does not follow that this is the true measure of the effect of the blow, and it is more likely that it is to be estimated by the work done by the weight in falling from a given height, thus 1 ton falling 16ft. is a force of 16 foot-tons, or 10cwt. falling 32ft. equally 16 foot-tons; both methods are measures of the dynamical effect, and neither is any proper measure of the dead load the pile will carry.

On Thursday week Lord Ebury distributed the prizes to the pupils of the Watford School of Art.

ARCHITECTURE AT THE CHURCH CONGRESS.

At the second evening meeting of the sub-section of the Church Congress at Leeds, on Tuesday, the subject for consideration was Church Architecture.

Mr. Gilbert Scott, jun., read the first paper. He wished to limit his remarks to the wants of our own day, and the means that should be taken to supply them. He thought every one would agree with him that our modern town churches were not what they ought to be. The Church was especially strong among the wealthy classes; yet no one would suppose so who entered a modern English town and compared our civil buildings with our churches. How striking was the comparison with ecclesiastical structures in the centres of Mediæval industry. The churches of such towns as Ghent, Antwerp, and Rouen were on a scale quite unknown here. With the single exception of S. Paul's Cathedral, which was commenced two centuries ago, and was still, in a measure, incomplete, we had produced nothing which could compare even with the works of our own forefathers when England was comparatively poor, much less with those of communities which were produced centuries ago by countries holding the industrial and commercial position to which England had now succeeded. In speaking thus he did not allude to architecture or style. He did not so much mean to express his objections to the architecture, poor though that was, as to say that he found most fault with their pettiness, which did not befit their high uses. No one could deny this. In foreign cities the churches towered up above the surrounding houses, and seemed in most cases to rule the city. This was true not only of the great cathedrals, but also of the ordinary parish churches which tourists seldom visited. In the ordinary parish churches of the Continent, modern as well as ancient, the whole scale was large—the dimensions were always imposing. The great fault of our town churches was that they were too small. If it were not for their small attenuated spires, competing feebly with factory chimneys, one would scarcely see them. Looking at a great modern English city from a distance, one saw at once the town halls, new hotels, railway stations, and such buildings, but the churches were by no means sufficiently prominent. They were designed too generally on the type of Mediæval village churches, and that not of the larger type. They seldom rose much above the average type, and it would even seem as if a small scale were considered proper for a church. The smallness of our ancient town churches was, no doubt, due to the fact that in every large town there was then some large cathedral or great monastic church to which the other churches served to some extent as chapels-of-ease. It was certainly much to be regretted that after the Great Fire in London the metropolitan parishes were not more grouped together, and a smaller number of churches erected on a larger scale. We should then have been spared the work of destroying certain churches and desecrating certain cemeteries, besides which the improvement would have told beneficially upon the more recent movement. Although it might be almost heresy to say it in Leeds, he thought the subdivision of parishes had been carried a great deal too far. We had pushed the parochial system to an extreme. What we wanted was large churches served by a numerous body of clergy rather than little parishes, little churches, and little schools. These would be far better than many miniature churches with their incumbent and single curate. He did not think that the modern smallness which he deprecated was to be attributed to niggardliness, there being plenty of means forthcoming, and plenty of generosity. They forgot too often for whom they were building, and lost themselves in petty calculations of accommodation. For so many thousand souls they provided so many hundred sittings—a proportion of sittings to souls which he left to be duly adjusted. Nothing really great could be done where such mean views prevailed. If the church was not viewed first of all and above all as God's house, it could not excite the enthusiasm of Christian liberality. Experience had happily shown that the attempt to erect a church on a scale not altogether unsuitable to its high purposes never failed to meet with abundant support. He therefore thought it was bad policy to content themselves with such small churches as they were in the habit of erecting. If the object were simply to erect places where respectable people might pay their Sunday tribute to propriety, what was commonly done was quite proper. The district church matched excellently well the semi-detached villa. If it were always remembered that the object was to work upon the people at large, to include the great artisan population and the poor, then it would be seen that quite another style of building was needed. Men and women of widely different classes would never be brought together to meet in the same church unless there was plenty of elbow room. It was no doubt quite common to see all classes assemble for prayers in Continental churches. He had seen in one church beggars, strolling musicians, working men with their blouses, and stylish ladies, but this was practicable, because the church was large enough to give all plenty of room. Small churches would always, he was convinced, be the monopoly of the respectable classes. The contrast between English and foreign churches was striking in the matter of accommodation. In England, unless one was the possessor of an appropriated seat, one felt outcast on entering a church. One felt forlorn, and stood looking about awkwardly until some patronising seatholder or gracious official showed the stranger into a seat, from which the stranger might then at his ease survey the more recent arrivals. In foreign churches, on the contrary, there were no seats to appropriate—and a visitor felt that one man had quite as much right there as another. He was not asking them to build on the grand scale of the Mediæval architects—although, probably, we might now rival even them; but he did ask that they should build their modern churches on a scale at least equal to that of their new hotels, railway stations, and town halls. We now had facilities for building on a large scale unknown to our ancestors, and we ought to have no difficulty in erecting imposing churches. We ought to sacrifice everything to size, and it ought to be especially kept in view that the interior of the church was the important thing, and not the exterior. The exterior, however plain, was certain to have a certain dignity from its dimensions. As regarded the planning of churches, we ought to feel perfectly free to follow simply and naturally our own requirements, and not be too much hampered by precedents. We made a great mistake in following too closely the Middle Age model in laying out church plans—not sufficiently considering the causes which brought about the Mediæval type of parish church. It must be their object, then, to produce every economy which would enable them to add to the dimensions of their churches. As regarded the planning of their churches, they ought to feel perfectly free to follow their own requirements, and not allow them to be hampered even by Mediæval precedents. They did not sufficiently consider the causes which brought about the Mediæval church. What they should aim at was not to produce buildings which by uniformity might be taken as works of the middle ages. He thought they ought, in erecting a church, to build it of sufficient size, leaving decoration and ornamentation to future liberality. It was the cost of the plan which was mainly at fault; and the great fault of their town churches was, as he said before, that they were too small. A new style was no more required than a new language, and he advised that they should use what they possessed freely, and render their churches, in the best sense of the word, popular.

Mr. J. P. Seddon also read a paper. He said:—The importance of ecclesiastical architecture is great, because, as stated recently by a distinguished prelate, if its character be debased, the character of religion is likely to become debased also. It has, however, even wider, if less exalted, claims to consideration, from having acted as a pioneer to the secular branches of the same art, which character it still maintains. In this commercial age the arts generally are valued less for their own sake than as safe investments, and yet without them society would be hardly civilised. Architecture, as the least saleable commodity in the auction-room, meets with least encouragement, and owes it mainly to the Church, its liberal patron, that its light has not been altogether hid under a bushel. During the last three centuries—the really dark ages in its history—art has become dissociated from daily life, degraded to the surface of luxury, and its study a mere dilettantism. The consequence is that the public have lost interest in it, and have now no conception of what architecture was when alive in the land; nor of what it might become again, as a means of diffusing happiness and health to the poor as well as to the rich. We roam now in mute wonder amid the ruins of abbeys, as in the lovely dales of this county, and cannot realise that such graceful work was S. Bernard's notion of the ascetic, and was the simplest common-sense manner of carrying out the requirements of that time. Yet then, not only were the castles of nobles, cathedrals, and town churches more richly wrought as befitted their less retired position, but the manors of the gentry, the houses of the burghers, and the cottages of the peasants, all in due subordination, were in complete harmony therewith. It was most fortunate that the Church was able to maintain, throughout that dreary period, so many of its priceless monuments, while even the memory of the charming cotemporary domestic architecture almost perished. These monuments are, however, solitary features now, in harsh contrast to the rest of our gloomy streets, and not, as of old, the culminating points in scenes picturesque throughout. Since the commencement of this century there has been some stir among these dry bones, and we are beginning to perceive that there is practical utility in art, and the Church has again taken the lead in the good work of reviving our old national style. As to quantity, if not quality, of what has been wrought during the last seventy years, we have cause for congratulation. In the aggregate number of buildings this period might compare with any in history. Restoration has also, in the same time, nearly effaced the traces of decay which had overtaken those structures which have been preserved to us as heirlooms from the past. While secular architecture has been and is still floundering in a slough of eclecticism, the Church, after fair trial of various exotics, has frankly accepted the Gothic style, and with a definite aim before it has since followed that out consistently. Still, no high standard of excellence, compared with that of ancient models, has yet been reached by the majority of modern effort, of which it is that I speak. Even our costly and sumptuous works fall short of quite secondary performances of the Middle Ages. No distinctive character has been wrought out to meet the requirements of those times, and a spirit of copyism seems to paralyse originality. Many noble buildings by a few leading architects of the day enrich this and other localities, yet such are but exceptions to the rule, the existence of which even the authors of those works would acknowledge. No doubt it was well that at first the new practice should be founded upon strict antiquarian research, and that each step taken should be assured by precedent; and it is this that has saved ecclesiastical architecture from the unbridled license into which the secular branches have fallen, to the grievous eclectic confusion of our streets. A time must, however, come, and many are clamouring that it has come, when we should no longer walk in leading strings; and it is certain that further advance is now urgently needed. Yet we must be careful not to lose the standpoint gained, and should take heed that all movement be really progressive. No new style, though demanded by some of authority, is either necessary or possible; literary men might as well ask for a new alphabet. Many ambitious attempts to graft sundry queer novelties into the architectural language left us by our forefathers have been extinguished by ridicule, and we may safely predict the same fate for their probable successors. The standpoint that we have attained is a fair acquaintance with the spirit of Gothic, as well as a tolerable familiarity with its details; we have, in fact, learned to read and spell in it; and the question now is, how, as authors, we ought to say that which is to be said in each particular case. Hitherto, it must be owned, we have been too much of copyists after the Chinese fashion, imitating even flaws. Our models having become reduced to mere empty shells, shorn of furniture and decoration; we have taken their poverty for purity and their bareness for purposed design. If we would sum up what has been effected, allowing for exceptions, we have built a multitude of churches, the vast majority of which would be best described in the language of passports as having naves ordinary, aisles ordinary, chancels ordinary, towers and spires most ordinary, and so on. We reckon up the capitals carved after every plant in the hedgerows, the windows dyed with all tints both in and out of the rainbow, the marble shafts to pulpits and fonts, and the number of yards of encaustic pavement, as if a collection of things indifferent could make a satisfactory whole. Perhaps till we learn to measure art by merit, and not by superficies, it is as well that our church interiors have bare walls and some plain glazing left. But it is sad to reflect that these many years of church building and restoration have done so little towards raising up a school of decorative artists, that art-workmen generally are a myth, and that an expenditure of millions has not given us as many works of real high art in our churches as might be counted on one's fingers. Now that funds are forthcoming for the decoration of S. Paul's Cathedral, a difficulty arises in finding hands to execute it, since our many able painters have, from sheer want of encouragement, devoted all their energies to another branch of their art, which seems absolutely to unfit them for this. It would, in speaking thus, be unjust not to mention the isolated examples of artists of high eminence who have lent their great talents to this decorative work with more or less success—such as Mr. L'Estrange and Mr. Gambier Parry for the roof of Ely Cathedral; Dante Gabriel Rossetti for the reredos of Llandaff Cathedral; and in connection with E. Burne Jones and Ford Madox Brown on the able glass paintings of the firm of Messrs. Morris, Marshall, & Co., Mr. Leighton, at Lyndhurst Church, and Messrs. Watts & Cave Thomas, &c., elsewhere. Turning now, as I must, to the few experiments my limited opportunities have afforded me to put principles into practice, with painful consciousness of their openness to criticism, I proceed to explain what those principles are. In the first place, much greater scale than usual seems needed for churches in large towns. It would be cheaper to build a few of noble size than many inferior ones, and the former would be far more impressive. If churches are to maintain dignity as compared with secular buildings, they want greater height, having to stand amid many-storied houses. As to area, too, they are now very much pinched, and the sight of a congregation issuing in rain, donning cloaks, and unfurling umbrellas while hustled in a crowd, is ignominious. What it would be in case of fire may be conceived. Ample space in the approach, as common in German churches, would be both a useful and dignified addition. Within doors it would be well that there should be room, beyond what is occupied for seats and necessary for passages. Vestries for clergy and choir should not be mere closets, and if at the western end, instead of, as usual, at the east, a more direct and wider processional path would be obtained. A different arrangement of plan, consequent upon change of ritual, seems desirable in town and large churches, though, perhaps, for small country ones there is no such need. The division into nave and aisles has lost its original use and significance, and the columns it entails cause inconvenience to many in a large congregation. The desirability that as many as possible should see the single altar, and that all should hear both service and sermon, calls for altered treatment of the body of such churches. I assume that the entire accommodation is on the ground floor, for, although galleries could be treated, as in many German churches, with excellent architectural effect, they are quite inadmissible as opposed to the proper ideal of Anglican worship. There are, however, limits to the size of the single unobstructed hall that would best meet the demand, and not be too large. Its width calls for corresponding height, for the sake of proportion. This is a desideratum in towns, but costly, and, as economy has usually to be studied, it would necessitate sacrifice of other features and in character of material. Brick, however, may well be used for stone, and ornament eschewed, to gain that effect which scale alone can achieve. One rule of the Incorporated Church Building Society, which restricts the width of naves to about 24ft., would have to be honoured rather in the breach than the observance. It has recently been waived at my urgent application. Modern science and appliances may well be called upon to do what has been done before, and precedents, if needed, are not far to seek. The church at Temple Balsal, in Warwickshire, is a simple parallelogram, 93ft. by 30ft. internally. It is a fine specimen of Early Geometrical work, with but few features, but those treated nobly. The old church, *quondam* cathedral, of Llanbadarn Fawr, near Aberystwith, has a simple aisleless cross plan, with each arm and central tower 40ft. externally and 32ft. between the walls. It is of the Lancet period, and its simplicity and grandeur are most striking. These characteristics rendered it a favourite example of the late accomplished architectural critic, the Rev. J. L. Petit. There was a church at Ghent, destroyed some years since, which was 167ft. long, by 53ft. wide, and accommodated 1,500 persons on the floor. This was built by the Dominican Preaching Friars, and though it consisted only of a nave, with chapels between the side buttresses, was most imposing. The cathedral at Gerona, in Spain, described by Mr. Street, has a nave no less than 73ft. wide. This accommodates 2,200 persons on the floor, and the whole are within reach of the preacher's voice. In England we have many churches of still larger area and capacity, though of more ordinary treatment. Among such are prominent S. Botolph's, Boston; Holy Trinity, Hull; and S. Mary's, Nottingham. The largest, however, is S. Nicholas, at Great Yarmouth, which may be cited as an example of grandeur in a parish church, capable of holding a vast congregation, and also on account of the scale of some of its features. In it can be seated upwards of 4,000 persons, and upon occasions it has held on the floor between 5,000 and 6,000. All the aisles are about 40ft. wide internally, and the arches between them and the transepts have spans nearly as great, and are richly moulded according to their respective dates, from the close of the thirteenth to that of the fourteenth century. Those who have seen the congregations that fill weekly the greater part of the vast area of this church know how inspiriting the sight is, and how suggestive of what might be done beyond the cramped dimensions of ordinary routine. In another new church in progress in the same town, and dedicated to S. James, I have endeavoured to follow to a certain extent the same type with some modifications, to suit a very peculiar site and modern usage. The plan is a Greek cross, formed by the nave and chancel, with transept, each 32ft. wide internally, with aisles 25ft. wide completing the square. The only internal supports are the four columns of the crux; 1,300 persons will be seated on the floor, and it is obvious, on a site that would admit of extension westward, the accommodation could, with advantage to the design, be greatly increased. To show how such works may be done by degrees, I may state that as yet only the chancel has been built, with its arch carried by the two western columns. This one side arch being temporarily filled in, this small portion of the permanent structure is connected with a temporary iron one previously on the site, and both together are used for service. The same spirit which has animated the inhabitants of this comparatively poor town to undertake the restoration of their grand old church, and to commence the erection of this new one upon such a scale, and to do the whole in the best manner, if but by slow degrees, might well be imitated in other richer and rising localities. It seems hardly fair to restrict buildings within narrow limits at first, and thus prevent their subsequent development. Yet to this being the common practice we owe that ordinary character of the majority of the churches built in our towns and their suburbs to which I have alluded. At the outset of an undertaking of this nature, the future rather than present need should be considered, and if the fulfilment of these be more than can be attempted, it is better to put up a mere temporary structure than to saddle posterity with one just too good to pull down, yet too poor to satisfy any one concerned. Fourteen years ago, in conjunction with Mr. Pritchard, I designed a church for S. Andrew's district, Cardiff, which was an early experiment to work out an idea for a town church, with the nave a wide parallelogram, 95ft. by 32ft., and aisles literally merely for the passages to the seats, leaving the space for the congregation wholly unobstructed. This design, though accepted, was, from faint-heartedness in a few concerned, not realised, but the building, though modified from this and so spoilt, sufficiently explains the general character intended, and which Mr. Street has since developed in his noble church of All Saints, Clifton, on a still larger scale. These instances may serve to show that it is practicable in Gothic language to meet very varied demands, and that it is by no means necessary to adhere strictly to old precedents in order to express what the Church may require in any place or circumstance. At the same time also it may be borne in mind that even when the wants of the Church have already been otherwise expressed in any place, it is quite possible to clothe the structure afresh, and retranslate, at any rate, some of their features into Gothic. This is a cheering thought when we consider that many charming sites in this county, and elsewhere, are disfigured by Pagan barn-like churches of the last century, and nondescript Peel churches of the early part of this century. The ground plan of most of these is not dissimilar from that suggested above, and they are more capable of being remodelled satisfactorily than is often thought, and of producing in the process effects which would hardly, perhaps, be attempted in new buildings. The churches at Fishponds, near Bristol, and at Lady Green, Buckinghamshire, were of this character—the former 40ft. wide internally, and the latter somewhat less. To these I have added chancels, so as to allow of future improvement of the naves without altering their general arrangement. In another case of additions to a modern suburban church I have tried, in a submitted design, to give to an apsidal termination of the chancel more dignity than is usual, and at the same time more space for numerous communicants, by making it wider than the chancel itself, and nearly a complete polygon on plan. This enables each side to contain a larger traceried window than is possible in an ordinary apse, the cramped appearance of which often detracts from the beauty of this otherwise charming feature. All the churches of which I have spoken, however, must remain somewhat exceptional, the majority being of the usual cheaper type, which may, however, be redeemed from the commonplace without cost. Instead of frittering away the means at command over the whole building, striving to make it in miniature complete at all points, effort should be concentrated on a few good features. Individuality would be thus attained, and each church made specially interesting. I can only touch further upon a few points connected with the treatment of such buildings as instances in which the last suggestion may be carried out. Instead of making nave and chancel separate, and each too short for effect, one continuous roof covering both is preferable, and the very considerable sum that the arch and wall of division would cost would be far more effectively spent upon an open screen, which might bear paintings, such as render many ancient ones in Norfolk rich treasures of art. Towers and spires—weaknesses of the age, without which no committee would think the most ordinary class of church complete—were better omitted, unless worthier far than scores or so of the numbers that have been erected, and to compass which most modern churches have been starved in other respects. Built usually as mere ornaments, irrespective of bells, a good peal of which would rock one-half into ruins, they hardly rise above the adjoining roof, and do not generally even clear the structure to which they are attached, so as, like old ones, to send forth, all around, the music of their bells. Let us have towers and spires too, when they can be really fine ones, and well furnished with good bells; otherwise, let us be content with more modest turrets, the best of their respective kinds. Within the walls, in place of profusion of indifferent ornaments, let the church be the shrine of some one jewel of art at least, that it might thus be worth the pilgrimage of those who now must seek such abroad—not that churches should be turned into mere picture galleries or museums. I wish that they were made less so than they are by the enterprising so-called art manufacturers of the day; but they were once the Bibles of the poor, and their influence as such was great. It is a mistake to think that this office of theirs has been superseded, although we have now the written Scriptures on every hand. The church should make use of all means of driving home to the hearts of men the great truths it is commissioned to preach, and in art it might still find a most able assistant. But the art I mean is not the architectural millinery which is now too often made to stand duty as for such. To be plain, the general conception of church decoration of the present day is an erroneous one; and we have often reason to be thankful for the prudery which makes it a sin to look at it when we are assembled for prayers, and for the beadledom which prevents our doing so afterwards. Scant minutes only are unfortunately allowed adventurous strangers, at the close of service, to peep through the chancel screen, if there be no distinction in design between the finery of tiles in the reredos and on the floor, and if it be but the gloss of mosaic that has been substituted for the former. The decoration of the Church, if it is tolerated, should be other than we usually find it. If its children ask for artistic bread, it is hard to give them fantastic diagrams of coloured stone instead. A better intellectual feast is needed than a bizarre medley of coloured bricks, or even a few panels of carving with figures of the size and with the expression of dolls, and smothered amid crocketted canopies, supported on twisted columns, and studded with agate balls. If our church doors were not shut out of service time, what valuable aids to education might not their walls be made! We blame the poor for dulness of apprehension, but do little to enlighten them. Our own houses are closed to them, and the art provided for their cottages is bad paintings and bad lithographs. Suppose, however, our churches were, in common with drawing-rooms, stored with works of sacred art, leaving the secular to grace museums, such might be studied as no pictures now are without the distraction caused by other objects competing with them for attention, and in peace and quietness. Surely here is an element of influence well worth cultivation. Donors would be more ready to give, and more careful as to what they gave, if they thought that their gifts would be looked at with other than side-long repeated glances. A higher style of art would be encouraged than the tableaux require which artists are now doomed to paint, since private houses alone receive their works. Art would be appreciated more than now when it can only be seen in monster collections, where the gilt frames jostle each other, and spectators are dazed by the crowd of incongruous objects; and people would find out that it had a tale to tell, and that that should be both worth telling and worthily told the Church could and should ensure. The limited time at my disposal has prevented my doing more than touch at random upon some of the numerous points relating to churches and ecclesiastical buildings generally, upon which I had wished to enlarge with regard to temporary churches, which, as I have said, had better often take the place of indifferent permanent ones. The unsightly and rapidly perishable iron construction usually adopted by them would be better superseded by the equally cheap and more picturesque fashion of the old English timber construction with plastic panels, and within they might be cheaply enough decorated in distemper colouring, and made the means of training our hands to the work, and of experimenting as to effects for the buildings which are to take their place hereafter. The practical questions of ventilating and warming of ecclesiastical buildings are as vital as these of artistic matters, for unless the bodies as well as the minds of congregations be maintained in comfortable and healthy condition, it is not possible that the services can be joined in with heartfelt worship.

Mr. F. C. Penrose directed attention to S. Paul's Cathedral, which, he said, although a Grecian building, had yet an interest among so large a number as were there assembled. There were some whose sympathies ran very strongly for the Gothic. His first studies were founded in the Gothic, and he loved it, but there was a broader view to be taken than shutting up their sympathies with style only. If a new cathedral were now to be built in London or any large town, it would be most unadvisable to follow the type of S. Paul's, because the feeling was against it, but they should feel proud of it when they considered the style and age in which it was built, when they might have expected something less ecclesiastical. It was a building of the foremost rank of its class, and when it was built no other style could be followed. He claimed for S. Paul's as one of the great buildings which was true in style, and in every way worthy of their sympathy. S. Paul's had been mentioned a good deal in the papers, and there were some divergencies of opinion in the committee who were engaged in the work of completing that building. He would say nothing about those divergencies of opinion, but would state that the work of completing S. Paul's would be thoroughly and energetically carried out. He dwelt at some length on the types of architecture, and gave a minute detail of the various characteristics of S. Paul's, with its ornamentation, &c., which he illustrated by reference to diagrams.

Mr. J. T. Micklethwaite said he cordially agreed with everything Mr. Scott had said except on one point—that that was not the place to talk of old churches. He stood up to plead the cause of old churches. Very few of them ever considered what the value of an old church was. There were memories of much importance connected with it. To the church men still go for worship, and the sacraments, perhaps, as they did a thousand years ago, Every generation owed something to the old church, and it had left something to it, if only they were its tombstones. There was an abominable practice which was called restoration. They could not restore a thing. If the thing had gone, it had gone. They should not understand that he would let the church remain exactly as it was. By all means repair the church and make it substantial, but he asked them to treat the building with that respectful consideration which it deserved. If they had an aged mother who was ill—if they had an old relative who was sick, they would not get rid of her gray hairs and give her a juvenile wig. As a matter of fact, there was not one church in 500 in England that had a single design. Very often they contained parts both of which were equally original and equally genuine. No man would respect church work earlier than 1500. He would ask why should the date 1500 be fixed? If they wanted to show their zeal for the decoration of the sanctuary, let them do it by putting in the best work they possibly could to suit their convenience or adorn the place, but take nothing out except that which had no business in the church at all, or interfered with the practical use of the building. The safe keeping of an old church lay with the parishioners and the inhabitants of the neighbourhood. If alterations had to be made the work should be put into the hands of a competent architect, but he could do nothing without the concurrence of the inhabitants of the place. If the old church was being what they called restored, let them use all the influence they possessed to prevent destruction, and get rid of that pernicious doctrine that no work was ecclesiastical unless it was Gothic. There was no connection in the least between Pointed architecture and the Athanasian Creed.

Mr. Beresford Hope, M.P., said that what they had heard was a proof of the building up of what he and others had been laughed at years ago for calling the science of ecclesiology. The building of new churches and the adaptation of old ones to our reformed Catholic ritual was a science, and not a mere matter of art or fancy. The longer he lived the more conservative he was in regard to old churches, and the more progressive in regard to new churches. In our old churches we could not be too conservative of their distinctive features. There might be quaint inscriptions regarding grotesque periwigged justices of the peace, which inscriptions often marked interesting passages in parochial and sometimes in English history. With regard to the town of Leeds, he must pay a tribute to the architect, and, no doubt, also to the vicar who had to do with the building of the parish church in which the sermon had been delivered that day. No doubt the church was heavy in its style. The painted glass was not good—was full of faults, indeed; but the effect of the whole thing was grand and impressive, showing that the man who designed it had got the right idea of building a church for a large town. Therefore, Leeds parish church, with all its faults, was a good example. He pleaded that ecclesiology was a science; and, more than that, it was one of those aids to grace which any rightly-informed Christian community was bound by the very charter of its existence in the first place to recognise, then to study, and, when it had analysed it, to carry out.

The Rev. Geo. Nash desired to say a word in defence of oaken benches for our English churches, an inference against them being implied by a comparison made with the freedom and openness of Continental churches. He did not see that the rows of wooden chairs in churches abroad had much advantage over our system of benches. The foreign system was not a protest against pew renting, because he had seen some such chairs marked with the names of worshippers at Notre Dame de Calais, whilst others were sold, not from quarter to quarter, or from year to year, but from service to service.

Mr. C. Hodson Fowler said that one advantage of large churches which had been rather overlooked was the possibility of having in them some space in the shape of an aisle, rather cut off from the rest of the church. Such an aisle, screened off with a second altar, could serve for daily prayers or the celebration of the Communion, and it was interesting for churchwardens to bear in mind with what economy and satisfaction an extra chapel of this kind could be heated during winter. Chairs, such as the last speaker took some exception to, were by no means universal on the Continent; fine oak benches, strictly appropriated, being quite common, for instance, in Bavaria and in the Tyrol.

The Rev. James Taylor, of Wakefield, did not think they should build large churches. If they were to have the poor to attend to their ministrations they must gather them close around them, they must get them into their immediate neighbourhood, have them close to their pulpits and desks, and let them hear everything they said, in order that they might understand what the minister said. Unless they, the poor, were interested in the discourses, they would not get the poor to attend their churches. He stood there as the advocate of the poor man in their churches, and they did not want large magnificent churches and elaborate services. These were very good in some places, and under some circumstances, but not the things wanted generally in the manufacturing towns; and, as the Bishop of Carlisle had said, on the mountain side, in such dioceses as his.

The Rev. R. A. Cayley, of Scampton, Lincoln, thought that architects in designing churches should provide some suitable side chapel or other place for the reservation of the holy sacrament, and he also suggested that the devotional effect might be increased if all the lights of the church were concentrated on the altar.

The Rev. Sir F. Gore Ouseley, of Tenbury, Worcester, noticed the acoustic properties of churches, and observed that there arose a great difficulty how to make churches so as to make it easy to preach in an intelligent manner, as well as to perform music well. He was strongly of opinion that the Mediæval architects understood this matter much better than we do. For the most part the ancient buildings were the best adapted for both these purposes. The cathedrals and abbeys were well adapted for music; and on the other hand, in their parish churches he thought it was notorious that the older churches were by far the easiest to preach in. He was inclined to think that too little attention had been paid to the geometrical proportions of their buildings, and he felt that if their modern churches were more carefully built, they should increase the strength and powers of many of their clergy, and get rid of the complaint made at the present day. He did not venture to suggest remedies for the evil of which he was complaining, but he threw out the suggestion in order that others who had given their attention to the subject more than he had done would try a remedy. What was wanted was that their congregations should not only be edified with the music, but with the words of the preacher.

The Rev. Theophilus Bennett, in speaking of the deficient acoustic properties of churches, said he used to preach in a place which he called a boomerang church, which conveyed his voice to the roof, and then back behind him. He would like to see more commodious and comfortable pulpits provided. He had seen Mr. Spurgeon in positions in the pulpit which he (Mr. Bennett) would be sorry to copy, but nevertheless he would like a little more of the freedom of movement which he had seen that preacher enjoy. After a few remarks from the Chairman, the Bishop of Hereford, the proceedings terminated.

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NOTES ON FIRE-BRICKS.*

(Continued from page 248.)

I NOW propose to attempt some general descriptions of the usual processes in vogue for making certain of the best known classes of English fire-bricks. In this manufacture more than ordinary care is found requisite to ensure a uniformly regular success from its processes, and it should be observed that there is almost as slight a similarity between the modes of manufacturing fire and building bricks as there is analogy between their uses. With the former, use involves incessant repair, and after a few months' wear in a busy furnace, entire renewal; with the latter, even if of worthless quality, a builder careless of reputation and indifferent to the possible discredit of distant failures, can often construct without fear of immediate detection.

Yet, even with this practical check upon quality, all experience in fire-bricks induces a certain wise toleration, so that isolated or exceptional cases of failure should not be allowed to justify the sweeping condemnation of an entire class.

In the following remarks care will be taken, for obvious reasons, to avoid identifying those makers who have courteously allowed the writer to inspect their works.

Yet the official recommendations of a certain agent's fire-lumps, taken in company with the experience of some of the most eminent iron and steel firms in Sheffield, may be allowed to sanction the opinion that a very high degree of excellence should be attached to the fire-clay manufactories of the Burton-on-Trent district. With these manufactories, therefore, it is proposed to begin.

BURTON-ON-TRENT.

The clay is dug at a depth below the surface of about 20ft., from open pits whose sides display the following strata:—

	Thickness. Ft.	In.
1. A common earthy or brick clay (burns white	6	0
2. A kind of coal, locally termed "smut"...	1	0
3. A kind of marl, locally termed "clunch"	6	0
4. A kind of coal, locally termed "smut"...	0	6
5. Marl	6	0
6. Fire-clay—a bluish-black or slate coloured clay, of which the upper stratum, 10in. or 12in. thick, locally termed "top black," is best	6	0
7. A kind of coal, locally termed "smut"...	1	0
8. Bottle-clay, for sewage and drain-pipes	9	0
9. Ironstone and "smut"	2	0
10. Pot-clay, for yellow ware	succeeds	

The fire-clay is worked up into bricks as fast as it is obtained from the pits. It is not here customary, as in many districts, to "weather" the clay by long exposure before use, but it is sometimes moistened with water, in order to lay the dust.

It is usually transported from the pits, and through the works, in trucks upon a tramway of 1in. rails and 18in. gauge; but the wire-rope overhead transport system is being generally substituted, and this will permit the easy transport of about a four hundredweight load in each of the "trunks" or boxes upon an endless steel wire rope suspended from poles, passing over Fowler's clip-drum pulleys, and worked by small portable steam-engines.

The clay is pulverised in Carr's disintegrator, composed of four cylindrical cages, 6ft. 3in., 5ft. 7in., 1ft. 9in., and 1ft. 7in. in diameter, arranged concentrically on wrought-iron disc plates, so that the steel bars or beaters are about 4in. apart, and 1ft. 4in. wide.

These sets of beaters revolve in opposite directions, by means of an open and crossing driving band working their disc axles, so that the first and third cases rotate in a direction contrary to that of the second and fourth; and they make about 200 revolutions a minute. The clay is lifted and delivered through a hopper into the interior of the machine (whose capacity is about 31 cubic feet) by means of buckets upon a "Jacob's ladder" endless band, 10in. wide. It is then driven through the mill, and ejected from it in a finely granulated state by centrifugal force, at the rate of from 20 to 30 tons an hour. The clay is in this manner sufficiently pulverised to render a riddle unnecessary, if meant for fire-bricks; but if for mortar or cement clay, it is passed through a wire mesh of five or six to the inch. The chief advantages of this machine over the ordinary "edge-runner and pan" system of a mortar-mill, consists in its ability to pulverise a moist, plastic clay as well as a dry clay, and in its power to disintegrate about 200 tons of clay per diem; in which time the roller and edge-runner process can, with the same steam power, grind only about 50 tons.

The bricks are fired in Hoffman & Licht's annular kilns, where, in successive chambers (each 15ft. wide, 8ft. 6in. high, and holding about 20,000 bricks), different sets of bricks are dried, heated, burned and cooled, by the currents of air feeding and escaping with the products of combustion from the same one fire. This form of kiln is found most economical in consequence of, firstly, the fuel being burnt with air already at an incandescent temperature; and, secondly, the waste heat from both cooling and burning goods being entirely utilised in drying the new, fresh bricks about to be burnt, and raising them to a high temperature. The consumption of fuel in this form of kiln is, therefore, very small in comparison with that in one of the ordinary form of construction; and it is found that the burning of 1000 bricks in the annular kiln requires only 2½ cwt. of Staveley dust coal, at 5s. 6d. a ton, instead of 20 or 25 cwt. of large "Grosby slack" coal at 7s. a ton.

The difference of cost for coal alone, therefore, amounts to about 8s. per 1000 bricks, and the saving of labour is also very considerable. The bricks so fired are peculiarly well formed, and well burnt; the former, because they escape the additional handling and transport required by the dry-shed process; the latter, because they are practically annealed by the gradual heating and gradual cooling in the successive processes of drying, heating, firing and cooling, which extend over a period of about three weeks.

The Stourbridge fire-clay district, including Amblecote, Briery Hall, and the Lye, covers an area of from eight to nine square miles, with six fire-brick manufactories in Worcestershire, and seven in Staffordshire.

From the pits on these works about 100,000 tons of fire-clay are annually raised, and the supply of fire-bricks has annually increased within the last 15 years from 14 million to 30 million per annum. In the neighbourhood, the Quarry Bank Church is built entirely of Stourbridge fire-bricks; The Brockmoor Church is built partly of fire-bricks and partly of blue bricks; and fire-bricks have been extensively used in the construction of the railway stations between Stourbridge and Birmingham.

The processes through which the clay passes during its manufacture into fire-bricks are nine in number—viz., digging, weathering, grinding, sifting, tempering, moulding, drying, and burning.

The Stourbridge fire-clay, or coal measure marl—a species of shale or slate-clay—is dug from pits (whose shafts are 6ft. or 8ft. in diameter, and steined) varying in depth from 120ft. to 570ft. It is generally found below three workable coal measures between marl or rock and an inferior clay. The former, overlying the fire-clay, is generally about 48ft. thick. The fire-clay seam averages 3ft. in thickness, never exceeding 5ft., and thinning down to 5in. or 6in. when close to faults or small disturbances in the measures.

The middle stratum of the seam is always selected for the fire-clay, the top and bottom being thought too "strong." After being raised from the pits the fire-clay is picked over by women, who select the best lumps or "kernels" for glasshouse pots, and reject for stains and mineral impurities. The pot-clay is only found in small quantities—about sufficient for the glass manufactories—and costs on the spot 55s. per ton, whereas ordinary fire-clay costs on the spot only 10s. per ton; and four tons of clay (about 3½ cubic yards) are required to make 1000 9in. fire-bricks, whose local price is 50s.

Some of the glass-house pots recently made for one of the large plate-glass manufacturers at Ravenhead, weighed as much as 30cwt. each when dry, and stood 6ft. high.

The clay is exposed in spoil heaps over as large an area as can be secured, for from 3 to 18 months, according to the state of the weather. The action of frost, as with ordinary brick earth, is of great service in disintegrating the compact tough lumps of clay, and in dry weather the clay is frequently watered. In very wet weather a three months' exposure will suffice for its proper "mellowing" or "ripening;" it ultimately slacks or falls to pieces. When new it is termed in the local phraseology "short and rough;" after due exposure it becomes "mild and tough." On some of the works the spoil heaps of clay contain over 10,000 tons, and it is estimated that seven tons measure about six cubic yards.

After sufficient weathering, the clay is ground in a circular pan by two rollers or cylindrical stones, shod with iron rims 2½in. thick, and weighing from 2½ to 3¼ tons a piece. They are driven by steam.

After being ground, the clay is carried on an endless band to a "riddle" of about 4 or 6 mesh to the inch for fire-bricks; 6 or 10 mesh to the inch for fine cement clay; 12 or 14 mesh to the inch for glass-house pot-clay; the large size mesh being used for the sifting of the clay in wet weather. The large particles which will not pass through the "riddle" are carried back on an endless band to the pan and then reground.

As a general rule, it is only for very large fire-brick lumps (such as blast furnace "tymps," 40in. long, and 11in. by 10in.) that reground pots, crucibles, or brick, locally termed "grogg," are added to the clay before grinding; and fire cement clay is always ground pure.

After passing through the "riddle," the clay is tempered, or brought to a proper degree of plasticity by the addition of water.

It is then thoroughly stirred and kneaded in a circular cast-iron pug-mill by revolving knives projecting from a vertical shaft driven by steam power.

The clay is forced down by the obliquity of the rotating knives, and steams slowly from a hole near the bottom, whence, after being cut by wires into parallelopipedons, it travels on in an endless band to the moulding sheds.

The bricks are then moulded by hand in the usual manner, in moulds 10in. by 5in. by 3in., or thereabouts, and dried at a temperature of 60° or 70° in sheds 120ft. long and 30ft. wide, beneath whose floors run longitudinally two flues, heated by small furnaces. In fine weather, however, the sun's heat is made to economise fuel.

The bricks are burnt in circular-domed kilns, or cupolas, locally termed "ovens," where they remain from eight to fourteen days, being fired with the real intensity of flame, or white heat, for about four days and three nights; they usually require seven days to cool down. The fire is slowly increased, and gradually lowered; the time of burning is regulated by a kiln man in charge, who inspects the baking bricks from time to time through holes in the domed roof of the "oven." A chimney stack is on the outside of the kiln, and the flame burns with a down draught descending through holes in the floor, the fire-holes being merely openings left in the thickness of the wall of the kiln, and protected from the wind by buttresses long enough to allow room for the firemen to attend the fires. The coal is, of course, obtained from the pits which provide the clay. Most of the kilns hold each 12,000 bricks, but some are made large enough to contain each 30,000 or 35,000 bricks, the capacity of a kiln being roughly calculated upon the assumption that ten bricks require 1 cubic foot of space in the kiln.

For conveyance of the clay and bricks about the Stourbridge works, little trucks called "skips" are employed in the pits, and throughout the brick-fields. Their platforms, standing 1ft. high, are 4ft. square, and consist of 1½in. planks. Their wheels, of cast iron, are 10in. in diameter, with 2in. axles. The rails 2ft apart, consist of ¼in. wrought-iron angle rails, 3in. wide, and 1½in. high.

NEWCASTLE DISTRICT.

The mode of fire-brick manufacture in the Newcastle district differs from that of Stourbridge in a very few and unimportant particulars.

The clay, in a spoil heap of 30,000 tons, is often exposed for seven or eight years, during which time it is picked over by boys, who remove pyritous fragments exposed on disintegration.

When required for fire-bricks it is ground by cylindrical edge-stones weighing three tons each, in a revolving pan, or else upon the ground, and then passed through a wire "riddle" of six or eight mesh to the inch.

Throughout the works are 18in. tramways, and pony-trucks convey the materials from place to place. After tempering, moulding, pugging, and drying, the bricks are burnt in kilns about 15ft. by 14ft. by 10ft. high, holding each 15,000 bricks.

They are fired for eight or nine days, during which time five tons of coals are consumed. The flame and hot air pass from a fire-box at one end of the kiln to outlet flues at the other end of it, and thence into an external chimney.

About 80,000,000 of fire-bricks are produced annually from the Newcastle district—*i.e.*, nearly three times the annual supply of the Stourbridge Works.

Very excellent fire-bricks are made from the refuse of *Kaolin* or china clay, found in Cornwall and Devonshire.

Kaolin is produced by the disintegration of "pegmatite," or felspathic granite, under the action of the carbonic acid and moisture of the atmosphere; it then becomes basic silicate of alumina. The kaolinitic fire-bricks, containing very little iron or lime, possess extremely refractory powers, and have, in fact, been found in the Royal Arsenal air furnaces to be equal or superior in this respect to any other known fire-bricks in the kingdom.

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* From a paper presented to the Corps of Royal Engineers by Lieut. G. E. Grover.

With their rivals they compare as favourably for economy as for endurance; but the former is, of course, a specially local advantage which might possibly disappear in another district.

Kaolinitic bricks enjoy, however, a very high reputation in lead-smelting furnaces, converting vessels of the Bessemer steel process, the retort furnaces of gas-works, kilns for burning iron pyrites, &c., &c. For the moderate heat to be withstood by ordinary boiler seatings, a burnt compound of kaolin, sand, and local clay, in equal parts, is found to be as good as the fire-lumps ordinarily employed.

The refractory powers of clay will be increased, of course, by the addition of pure silicious sand, which can be produced by grinding sandstone if it is not obtainable in a state of nature.

The Dinas fire-brick is well worthy of attentive consideration, if indeed, solely for the reason that it is, in the opinion of Mr. C. W. Siemens, F.R.S., the "only material of those practically available on a large scale, that I have found to resist the intense heat at which steel-melting furnaces are worked." Now, the average heat of a steel-melting furnace, measured by electrical resistance, may be accepted as 2200° Centigrade (= 3992° Fahrenheit), and that of the ordinary air-furnace, at welding heat, in the former, the Dinas brick, will last, it is found, for four or five weeks, though their thickness will in that time have been reduced from 9in. to 2in. But these extraordinary results, it should be remembered, have been only obtained in the Siemens Regenerative Gas Furnace, wherein the flame is quite pure and free from the suspended dust which is usually borne from the fuel by the keen draught of air through an ordinary reverberatory furnace, and the brickwork is not fluxed on its surface, and gradually cut away thereby, but it fails, if at all, from a general softening and fusion throughout the entire mass. For the ordinary puddling-mill or air furnaces, the Dinas bricks, notwithstanding their ability to resist very high temperatures, are somewhat troublesome in actual practice. They are very friable, porous (and thus imbibe moisture freely), they swell extremely with heat, and do not contract to their original dimensions.

If allowed to cool down (and it is customary to let the furnaces "stand" in most works, from mid-day on Saturday till mid-day on Monday) they are apt to crack, flake in fragments and then fly to pieces in consequence of the decrepitation of portions of the quartz composing them. From their extreme tenderness they are unlikely to prove durable if applied in portions of furnaces where they would be subjected to much mechanical wear. Yet their refractory powers are remarkably great, and they bear a very high reputation with many owners of copper-smelting, iron, glass, gas-works, coke ovens, &c., and they seem to be highly esteemed for the arches of reverberatory furnaces in the copper-works of Swansea, at Middlesborough, and at Ebbw Vale. The tabulated analyses show the high percentage of silica which these bricks contain; and from their silicious nature it is obvious that they should not be exposed to the action of slags rich in metallic oxides, or to the fumes from lead ores, or to proximity with alkiline substances generally.

NORTHERN ARCHITECTURAL ASSOCIATION.

A QUARTERLY meeting of the Northern Architectural Association was held on the 3rd inst. at the Old Castle, Newcastle-on-Tyne, Mr. M. Thompson, the President, in the chair. Drawings of concrete buildings were exhibited by the President, and several photographs of the New Law Courts were shown by the Secretary. Messrs. Thomas Tillman, Sunderland; William Henman, Stockton; and J. W. Alexander, Stockton, were admitted associates.

The Secretary (Mr. Thos. Oliver) read extracts from a report of the last conference of architects held at London, and stated that the main results had been a revised scale of charges, and a revised schedule of notes to be sent to persons conducting competitions. The question of the employment of surveyors, and the incorporating of the bills of quantities with the contract, appeared to be questions of such difficulty that it was decided to leave them over for two years. The Alliance, which consisted of eleven associations, had held a meeting before the opening of the conference. It was suggested at that meeting that if the conference took up the subjects which the Alliance have been pressing, they should adjourn *sine die;* and a resolution to that effect was proposed. He, however, proposed that the Alliance should be continued with the same officers, and that the real question to be taken up should be that of architectural diplomas. He was requested to make arrangements for issuing a circular requesting the opinion of the various architectural societies, to be laid before the Institute of Architects at their meeting in 1874.

CONCRETE BUILDINGS.

The President then introduced the subject of concrete buildings, and read a paper upon it. He said he believed architects would have to turn their attention to the adaptability of some new material for buildings, the cost of stone and brick at the present time being so very high. It was the duty of all practising architects to look out for some other substance, the use of which would bring buildings down to a reasonable cost, while, at the same time, they were sufficiently substantial. He did not believe that architects were either educated or employed to spend money, but rather to save it, and, therefore, it behoved them to look forward and keep up with the times. He had tried concrete in two or three instances in Newcastle, and had found it very much cheaper than either brick or stone. They also attained another object, and that was securing a wall, where space was limited, of great strength, with less thickness than would be necessary if it were built of brick or stone. It was a very admirable substitute where great heaps of gravel or slag were accumulated; for while such refuse was available for scarcely any other purpose, it afforded an excellent material for the formation of concrete buildings. Mr. Thompson here referred to a photograph of a large seed warehouse, which had stood the test of grain, an article that produced a greater strain upon the walls than almost any other class of goods that could be stored. He then gave details of various experiments which had been adopted to test the strength of concrete as compared with brick, the result being greatly in favour of the concrete, especially when built with brick and stone bondings. It was, therefore, very important to know that such rough materials as broken bricks and stones could be put together and run in with grouting, and produce a wall of such great strength and cheapness. In preparing foundations, he believed it was quite competent, instead of digging out the soft stuff and putting in concrete, to force down the soft substance and make it a perfectly solid mass, thus securing one of the best of foundations. In laying down concrete floors, he thought there was an advantage in covering them with water, because they set better under such a condition, and became harder and stronger than if they were allowed to dry under the influence of the ordinary air. At Cullercoats a great deal of concrete building was going on. The walls were generally formed of iron slag and sandstone, with grouting; and when dry, if struck with a hammer, they sounded like the ring of a piece of metal. The inner walls of a three-story building need not be more than six inches and the outer walls of nine inches thick. Concrete houses were of course exceedingly dry and comfortable. The inside required simply a finishing coat of plaster, and the saving in that department more than covered the cost of the outside stucco, which did not peel off the concrete as it did off stone and brick walls. Buildings constructed with concrete walls, floors, and staircases were perfectly fireproof, the windows and door frames being alone capable of burning.

Mr. Ebdy, Sunderland, agreed with the President that bricklayers and stonemasons were becoming so independent in the present day that it was absolutely necessary to become independent of them as soon as possible. He believed that where stone and brick were scarce, it was necessary to fly to some such substitute as the concrete method, and it was no doubt well adapted for the construction of workmen's houses or ordinary dwellings. They had not seen it used in superior buildings, however, and up to the present time they had had little experience of its durability. They knew it made a solid body, but the question was—would it last? Would the thin frail walls that were being put up endure, and be found as solid ten years hence as now? The effects of contraction and expansion in some property put up three years ago had been such as to rip up the building as though there had been a pit working beneath it. In all concrete floors provision had to be made for expansion and contraction, and it would no doubt be found that the same effects took place in concrete buildings.

Mr. Shotton, Sunderland, gave an instance of a floor 41ft. by 56ft. where no such defect existed as either the expansion or the contraction of the material.

Some discussion took place on this point, during which the President admitted that at first there would be either expansion or contraction, though after the concrete was once set the expansion or contraction was at an end.

Mr. Shotton was quite of opinion that in many places concrete would ultimately supersede stone.

Mr. Oliver was doubtful as to the durability of the material. The question was, would atmospheric influence not affect it, as was the case with Portland stone? Another objection was that in concrete buildings they would never be able to produce anything like architectural or æsthetic effect. Instead of good brick and stone they had a smooth surface, and would have to resort to stucco and painting.

The Chairman explained that he did not recommend concrete for exterior work, but simply for inner walls.

Mr. Oliver was anxious to know the difference in cost in favour of concrete. He was told that its use must be regulated by the locality, but if broken bricks and slag could not be had what were they to use? If new bricks were broken up he did not see how it could be cheaper.

The President gave an example of the cost in the case of a building, where, whilst the lowest tender for brick and stone was £300, a concrete structure was put up for £75.

Mr. Dunn having spoken favourably of the use of concrete,

A vote of thanks was passed to the President for his paper, and the meeting closed.

BLACK VARNISH FOR WOOD.

A GERMAN trade circular describes two kinds of black varnish: 1. The ordinary black varnish for different kinds of wood; 2. The black ebony varnish for certain woods which approach nearest to ebony in hardness and weight. The ordinary black wood varnish is obtained by boiling together blue Brazil wood, powdered gall apples, and alum, in rain or river water, until it becomes black. This liquid is then filtered through a fine organzine, and the objects painted with a new brush before the decoction has cooled, and this is repeated until the wood appears of a fine black colour. It is then coated with the following varnish: a mixture of iron filings, vitriol and vinegar is heated (without boiling), and left a few days to settle. If the wood is black enough, yet for the sake of durability, it must be coated with a solution of alum and nitric acid, mixed with a little verdigris; then a decoction of gall apples and logwood dyes are used to give it a deep black. A decoction may be made of brown Brazil wood with alum in rain water, without gall apples; the wood is left standing in it for some days in a moderately warm place, and to it merely iron filings in strong vinegar are added, and both are boiled with the wood over a gentle fire. For this purpose soft pear wood is chosen, which is preferable to all others for black varnishing.

For the fine black ebony varnish, apple, pear and hazlewood are recommended in preference for this; especially when these kinds of wood have no projecting veins, they may be successfully coated with black varnish, and are then most complete imitations of the natural ebony. For this varnish: 14oz. of gall apples, 3½oz. of rasped logwood, 1¾oz. of vitriol, and 1¾oz. of distilled verdigris are boiled together with water in a well glazed pot, the decoction filtered while it is warm, and the wood coated with repeated hot layers of it.

For a second coating a mixture of 3½oz. of pure iron filings, dissolved in ¾ of a litre of strong wine vinegar, is warmed, and when cool the wood already blackened is coated two or three times with it, allowing each coat to dry between.

For articles which are to be thoroughly saturated, a mixture of 1¾oz. of sal-ammoniac, with a sufficient quantity of steel filings, is to be placed in a suitable vessel, strong vinegar poured upon it, and left for fourteen days in a gently heated oven. A strong lye is now put into a good pot, to which is added coarsely bruised gall apples and blue Brazil shavings, and exposed for the same time as the former to the gentle heat of an oven, which will then yield a good varnish. The pear wood articles are now laid in the first named varnish, boiled for a few hours, and left in for three days longer; they are then placed in the second varnish and treated as in the first. If the articles are not then thoroughly saturated, they may be once more placed in the first bath and then in the second.

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City Permanent Benefit Building Society.—The sixth annual meeting of this society was held at Guildhall Tavern, Gresham-street, on Wednesday week. From the annual report and financial statement it appeared that the directors again recommended that profit equal to 7½ per cent. per annum be added to all eligible subscription shares of the society. The report was adopted.

DOORWAY, SEEZ CATHEDRAL.

It is believed that a view of the central porch and doorway of the west front of Seez Cathedral, the subject of the illustration, has never before been published, probably on account of the dilapidated condition of the filling in of the arches, which are now simply plastered. It is true that portions of this porch have been illustrated by M. Viollet-le-Duc in his "Dictionnaire Raisonné," where (Vol. IX., p. 351, Fig. 4) one of the doors shown in the drawing is figured. Mr. King, in his "Study Book of Mediæval Art and Architecture," has illustrated, but to a very small scale, the whole of the Cathedral, his drawing of the western façade showing the central doorway to a scale of 1 in 300 only. Mr. Norman Shaw, it will be remembered, in his work gives a drawing of the south porch of the western façade.

The porch dates from the early part of the thirteenth century (1230). The carving, especially of the imposts, is very fine and well preserved. It is difficult to say for certain what the sculptures in the tympanum represent; the lower portion, at least, would seem to have reference to the Institution of the Holy Eucharist.

Mr. King states in his work that "tradition asserts that the Cathedral stands upon the site of an ancient heathen temple. The first church, erected on this spot by S. Luise, who evangelised the country in the fifth century, endured till about the year 990, when it was superseded by another, which was accidentally burned by its own Bishop shortly after its erection, and a third building, of greater magnificence than either of its predecessors, was consecrated in the year 1126. But the present Cathedral cannot be ascribed to an earlier date than the thirteenth century, and must, therefore, be the fourth Christian church built upon the same spot."

The Cathedral shows, in some parts of the nave, very considerable settlements. During the last few years restorations, with the best intentions, but in the worst taste, have been in progress.

The drawing from which the illustration is taken was made during extremely hot weather, and almost in the midst of a fair, held under the shadow of the Cathedral itself; the noise of the vendors (such only as our continental neighbours can make), each trying to outcry one another, as may be imagined, was extremely distracting. Seez, itself, is a very quiet city, containing about 5,000 inhabitants only.

Thomas Batterbury.

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LUNATIC ASYLUM, S. ANN'S HEATH.

We have before spoken of the competition designs for this asylum. (See Building News, August 2, 1872, No. 917.) We give a photo-litho. engraving of the central tower of premiated design by Messrs. Crossland, Salomons, & Jones, of 21, Whitehall-place. The asylum is to accommodate 200 inmates in four classes, 35 first-class, 30 second-class, 15 third-class, and 20 fourth-class. The whole of the heating, cooking, and hot-water apparatus to be after a system invented by Pierre Leynane, and as carried out by him at several large institutions in France and Belgium. The buildings are to be erected in red brick, with Portland stone dressings. All the day-rooms to be on ground floors.

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HINGHAM CHURCH, NORFOLK.

This church, which is dedicated to S. Andrew, and is one of the largest churches in the county of Norfolk, has recently been restored, and the nave and aisles reseated. The whole church, with the exception of a few minor portions, is of fourteenth century work, and is said to have been rebuilt by Remigius de Hethersete, A.D. 1316 to 1359. It consists of a nave nearly 100ft. long by 28ft. wide; north and south aisles, each 14ft. 6in. wide; a chancel about 60ft. long by 28ft. wide; a western tower, 22ft. square inside; a south porch and a vestry (now in ruins); from the floor to the apex of new nave roof is about 60ft. The nave piers and arches are of lofty and elegant proportions, with well moulded caps and bases; the aisle windows are of two lights each, filled with very good Decorated tracery. The east window of the south aisle—which is of three lights—is a very elaborate and excellent specimen of the tracery of this period. In the chancel is a very handsome and lofty monument to a Lord de Morley, erected in the fifteenth century.

The restoration, as far as it has gone at present, has consisted chiefly in removing the low-pitched, decayed nave roof, and replacing it with an elegant hammer-beam roof of oak, in the position and of the pitch indicated by the original dripstone on the east wall of the tower. The new roof is of simple character; moulded and curved ribs springing from carved stone corbels support the moulded and crenellated hammer-beams, from which spring the lofty main moulded and curved ribs. The spandrels between the lower ribs and the wall are filled with foliage of varied design, and the spaces over hammer-beams with tracery. The aisle roofs, which are also formed with hammer-beams, are not entirely new, but have been carefully restored. The roofs of nave and aisles have been covered with Whitland Abbey green slates, which harmonise well with the old work. The stonework and walls throughout, with the exception of south porch, vestry, and tower, have been carefully restored, both outside and inside. New eaves cornices have been put to nave and aisles, new copings to gables, and cross to east gable of chancel. The internal stonework of nave and chancel bore evidence of having been much damaged by an extensive fire, which apparently extended from the west end of nave to the east end of chancel. Several of the nave shafts were scaled from top to bottom; the defective parts had at some time been patched and covered up with plaster, and then the whole stonework and plaster alike had been coloured with a yellow wash. Upon the removal of the plaster much of the stone was found to be still in a very loose and unsound condition; these portions were cut out and replaced with solid stonework, making every part perfect and substantial. The remains of a piscina and three sedilia were discovered in the south wall of the chancel, which appear to have been inserted in the fifteenth century; they were so much injured and scaled by the action of the fire, and mutilated by projecting parts being chopped off when the walls were plastered, that it was not considered advisable to restore them; parts have, however, been left exposed to view, which give a good idea of what they have been originally.

After some opposition, usual in such cases, it was decided to clear away the whole of the old boxed seating with which the church floor was covered, and which was in a dirty and dilapidated condition, and to reseat the nave and aisles with open benches in oak, resting upon deal flooring, with oak curbs for the bench ends, the rest of the floor being paved with red and black Staffordshire tiles. All the seats have sloping backs, and the solid oak bench ends, as well as the front and back framing, are ornamented with carving, consisting of a great variety of foliage with which heads and other animal and insect forms have been introduced. It has been all designed and arranged conventionally from nature by the architect, and executed, with a few exceptions, by Mr. James Forsyth, of London, from full-size drawings supplied by Mr. Colling.

The church has been fitted up and lighted by gas; this has been effected in the nave and aisles by simple jets above the capitals of the piers. The chancel is lighted by a handsome brass corona. The gaswork has been done by Mr. Pank, of Norwich.

The whole of the works of the restoration, with the exception of the oak seating, have been carried out in a very satisfactory manner by Mr. Robinson Cornish, builder, of North Walsham, for the woodwork; and by Mr. J. W. Lacey, builder, of Norwich, for the stonework. The oak seating was made and fixed by Mr. Wm. Hubbard, builder, of East Dereham. The architect was Mr. James K. Colling, of London.

The cost of the restoration and reseating has been about £3,250, and it is estimated that about £500 more is required to rebuild the vestry, now in ruins, and restore the south porch and tower.

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THE BUILDERS' BENEVOLENT INSTITUTION.

The twenty-fifth annual report of the Builders' Benevolent Institution has been published. During the past year four pensioners have been elected and five have died. During the year £752 16s. 5d. Stock Three per Cent. Consols has been added to the Funded Property of the Institution; £643 14s. 5d. for the Relief Fund, and £109 2s. for the Building Fund; being a total of £16,142: £12,781 9s. 6d. for the Relief Fund, and £3,360 10s. 6d. for the Building Fund. The Annual Ball, held at Willis's Rooms, King-street, S. James's, in January last, produced a profit of £76 6s. 7d., being an increase over the previous year of £21 16s.

The Directors, in thanking the supporters of the Institution, hope that they will not relax in their efforts, but endeavour themselves, and through their friends and connections, to procure additional funds, so that a larger number of pensioners may be elected at the next election.

Mr. Edwin Lawrence has kindly consented to be the President of the Institution for the ensuing year.

THE NEW BRIDGE AT LEEDS.

The larger portion of the new bridge being erected over the Aire, at Leeds, is now completed. The bridge, when finished, will be of one span, measuring 100ft. on the square and 102ft. 6in. on the skew. The height of the centre of the arch is 12ft. 6in. above the ordinary water-line. The abutments are composed of solid masonry, and are excellent specimens of workmanship. Through each is a culvert, that on the south side being 10ft. diameter; the other on the north being 7ft. The stone used has been obtained from Horsforth and Meanwood. The span of the arch will consist of two main cast-iron girders, on which the ironwork parapet will be borne, and eight intermediate girders. The space between the girders has been covered in by buckle plates. Upon this about 6in. of bituminous concrete has been laid, and when this has been covered to a sufficient depth with road metal, the roadway will be ready for traffic. On the portion of the bridge nearly completed there will be a 12ft. footpath, and a roadway from 19ft. to 20ft. in width. When the structure is finished about 130 tons of cast iron, and from 270 to 280 tons of wrought iron, will have been consumed. The probable cost of the bridge will be £18,000. It is being erected after the designs of Mr. T. Dyne Steel, C.E., of Newport, Monmouthshire. The consulting engineer is Mr. W. H. Barlow, of Old Palace-yard, Westminster. The contractor for the whole of the works is Mr. D. Nichols, of Leeds.

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THE S. BARTHOLOMEW MEDAL.

An object of great antiquarian interest has just been found in the Old Mint Buildings, in Cowgate, Edinburgh. The buildings are being taken down by order of the Improvement Trustees, with a view to the widening of the street. Some of the workmen discovered in the crevice of a wall a specimen of the medal struck by Gregory XIII. to commemorate the massacre of S. Bartholomew. The existence of such a medal has long been disputed, and, as our readers are aware, the discussion has lately been revived. The specimen just found is rather larger than an English half-crown, and bears on the obverse side the effigies of the Pope, with the legend, "GREGORIUS XIII., PONT. MAX. AN. I." (Gregory XIII., supreme pontiff, in his first year); and on the reverse, with the legend VGONOTTORUM STRAGES (slaughter of the Huguenots), 1572, a representation of the massacre, in which is seen the figure of a winged and helmeted angel, with a cross in one hand and a sword in the other, engaged in the work of destruction. The medal is in good preservation, and, from the sharpness of the figures, is considered to be an impression from the original dies, dating, probably, very near the time of the massacre.

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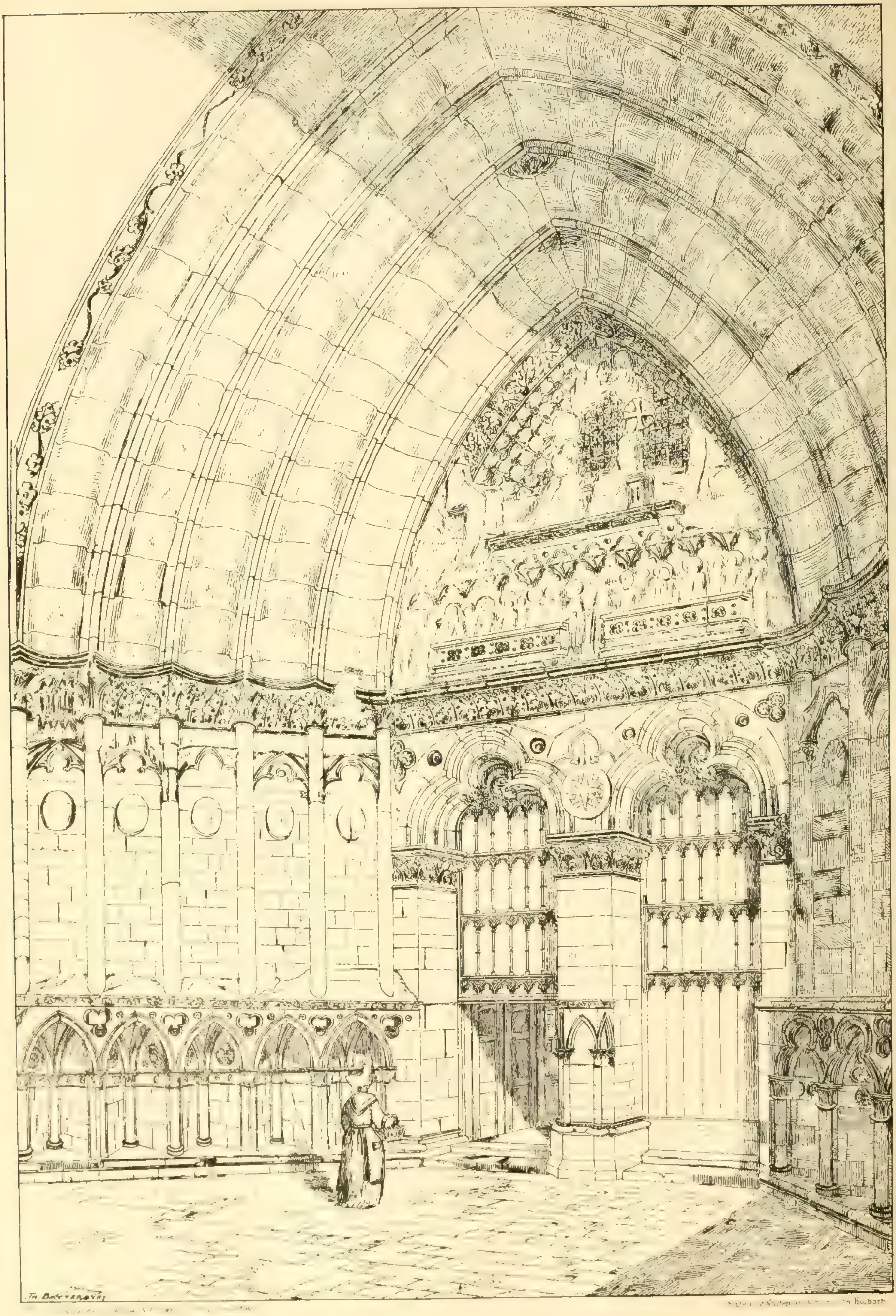
SCHOOL BOARDS.

Rochester.—At a meeting of the Board held at Guildhall, on Thursday week, the Chairman said the architect, Mr. Walker, had sent the drawings and plans for the proposed new schools, for the contractor, Mr. J. G. Naylar, to sign. As, however, the Education Department had not sent down the order, this could not be done. The Chairman also alluded to a letter from the architect, in which he stated that he had removed the turret from the new schools, as he thought sufficient ventilation could be procured without it. The plans had been signed on the belief that no alteration in them would be made, and the Education Department had also approved of them before the tenders were invited. Mr. Walker had explained to him that as the new building would be so high and the streets in the neighbourhood were so narrow the turret would not be required—.Mr. Hayward considered it most improper for such an alteration to be made without consulting with the Board.—Mr. Belsey said he supposed Mr. Walker thought the building could not be done for the money.—Mr. Aveling said the architect should have consulted with the Board before doing so.—The Chairman was of the same opinion. The building would be a good one, and the contractor who was about to erect it for £2,000 would have a hard nut to crack (a laugh).

Thornton (Bradford).—At a recent meeting of this Board, it was determined to purchase 4,900 square yards of land, at 2s. 6d. per yard, at Lodge Field, Denholme, as a school site. The clerk was instructed to prepare plans for the approval of the Education Department, and to ask that the Public Works Loan Commissioners be recommended to advance money to complete the purchase. The clerk was further instructed to request the selected architects to prepare the competitive plans for Thornton School.



DOORWAY, WEST FRONT, SEEZ CATHEDRAL

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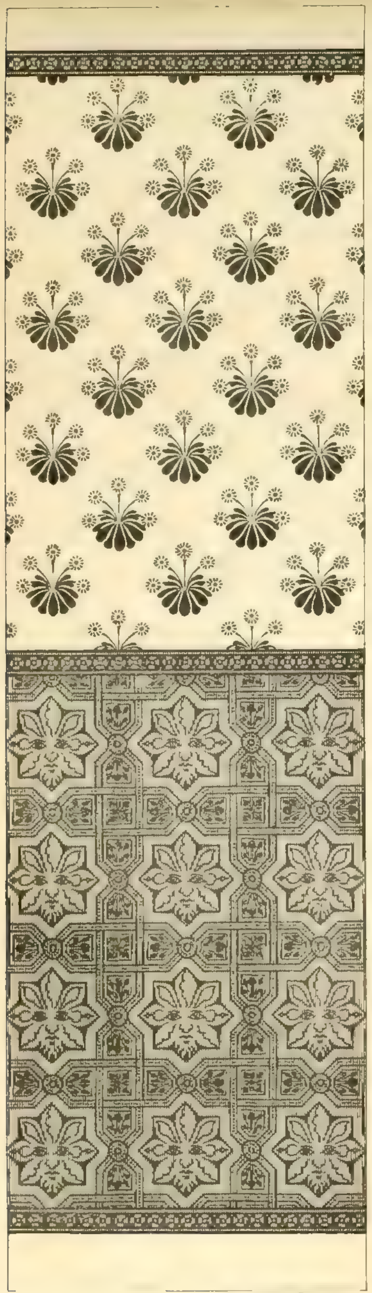

By W Burges

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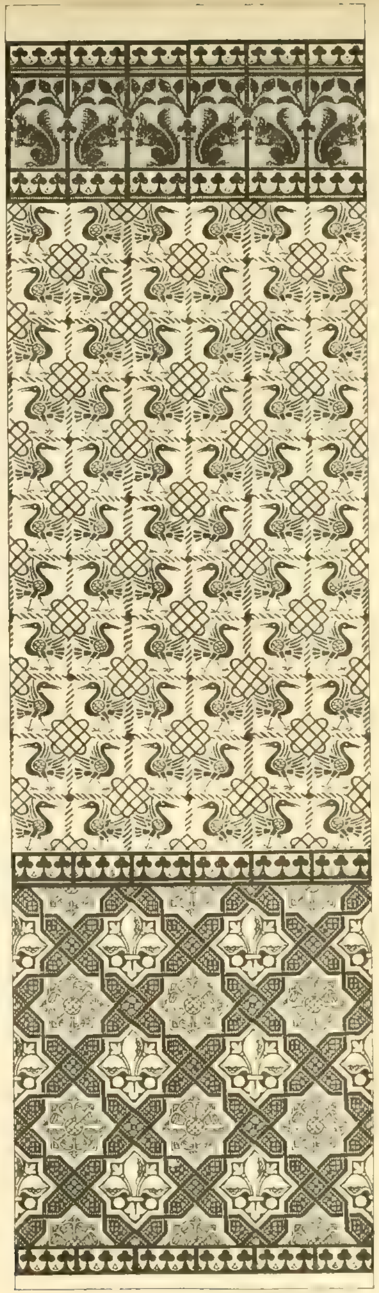

By W Burges

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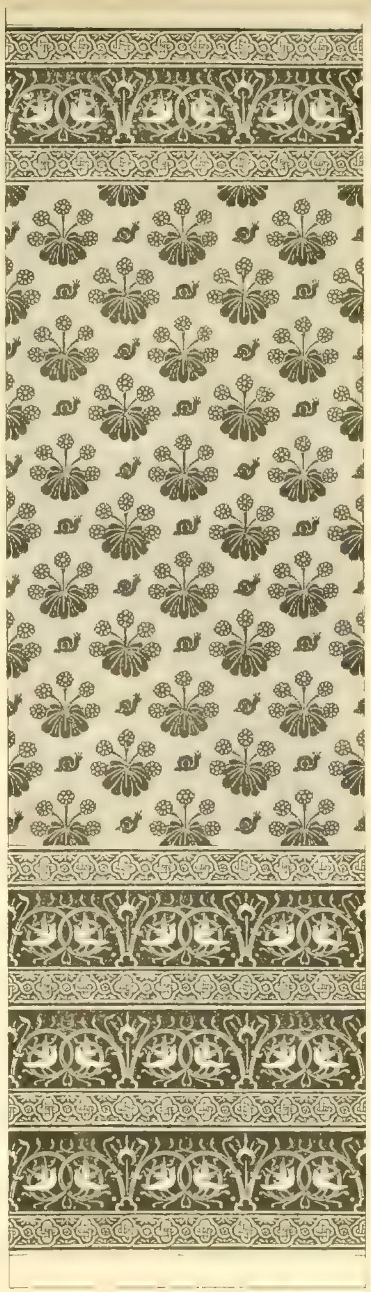

By W Burges

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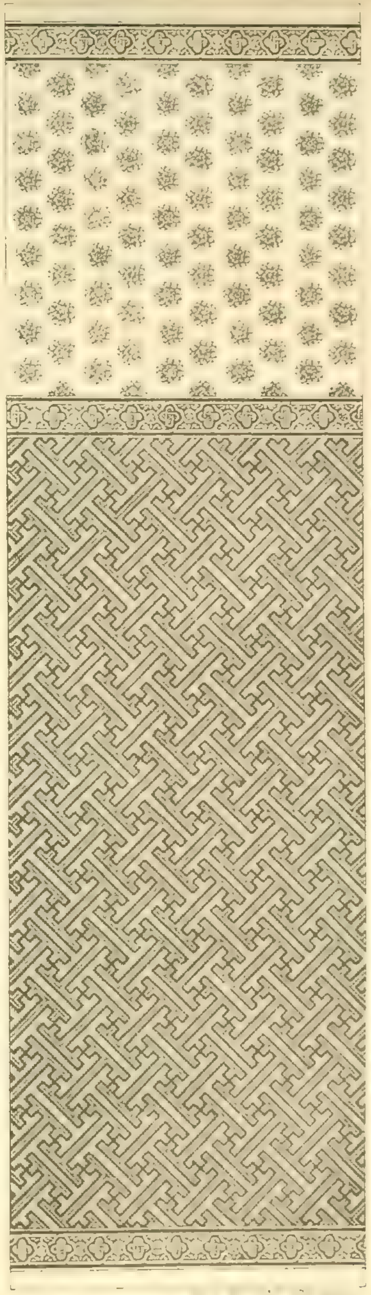

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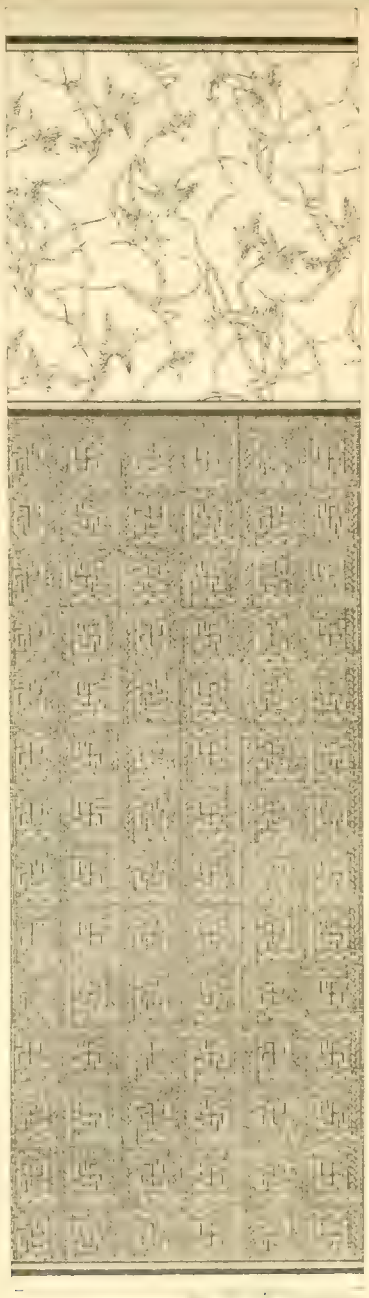

WALL-PAPER DECORATIONS.

MANUFACTURED BY JEFFREY & CO, ISLINGTON N

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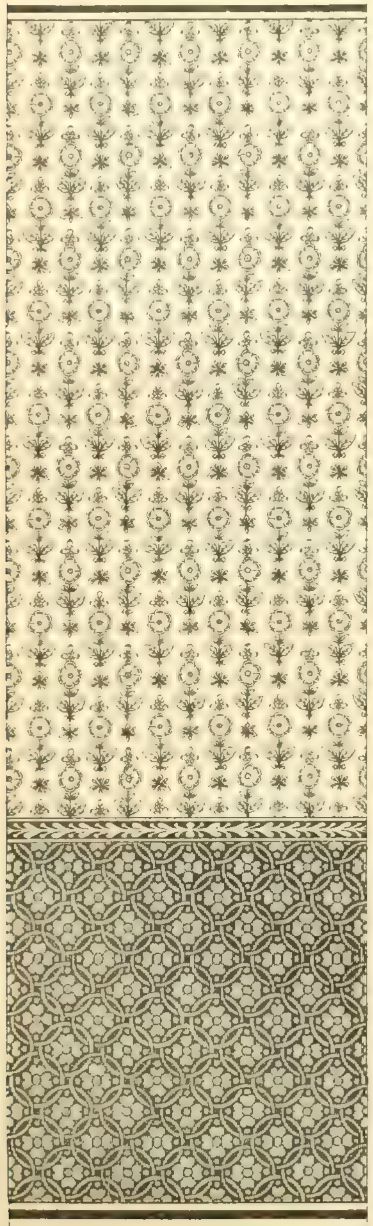

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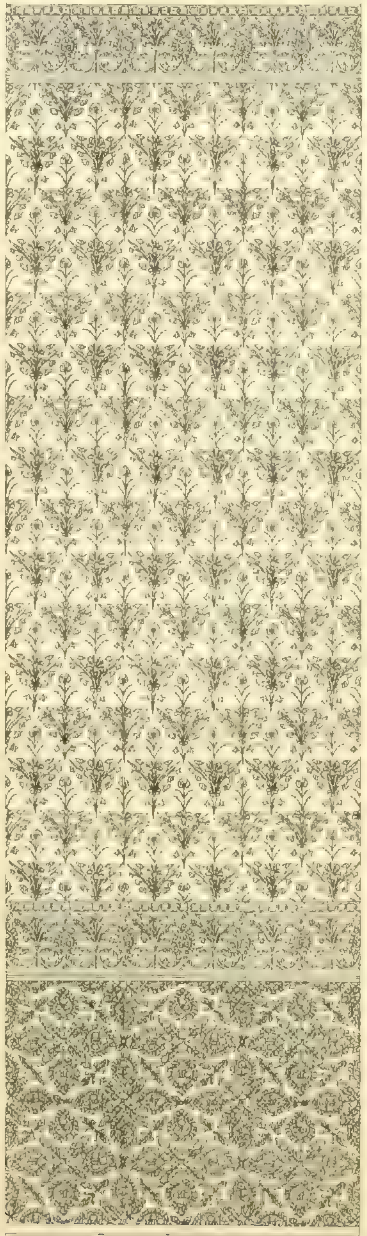

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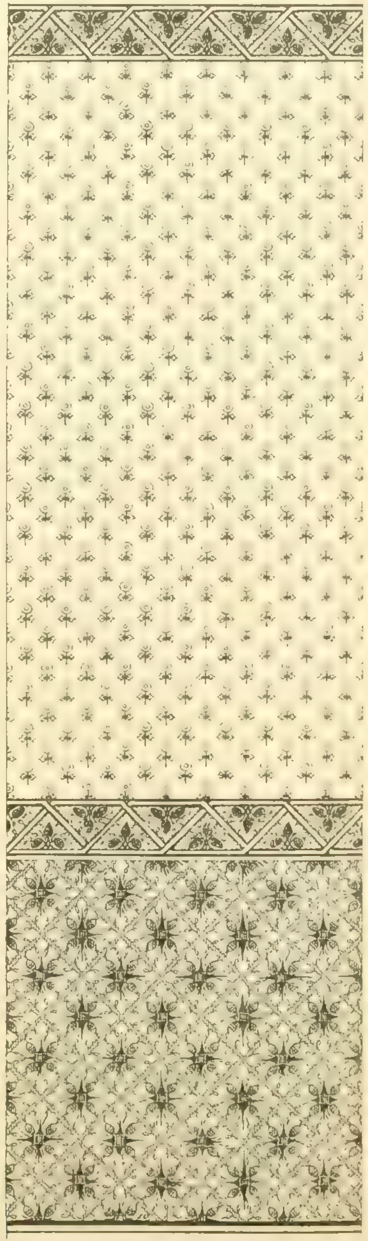

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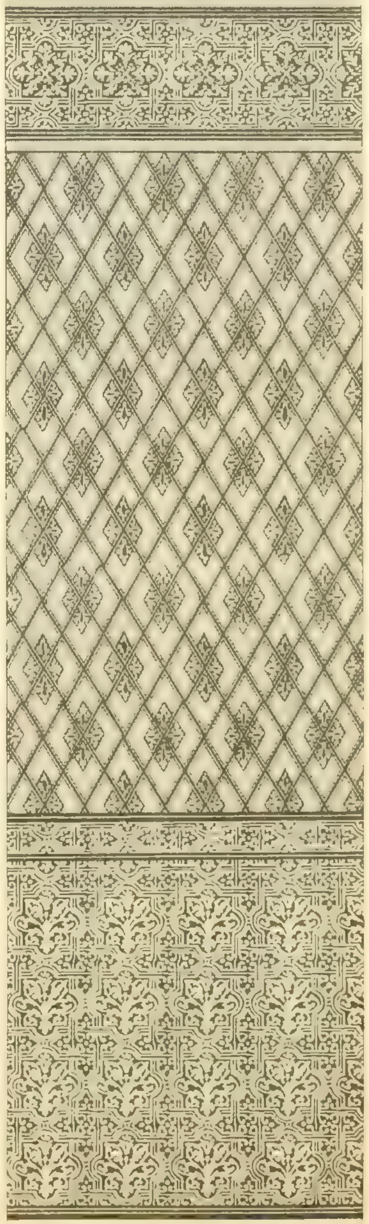

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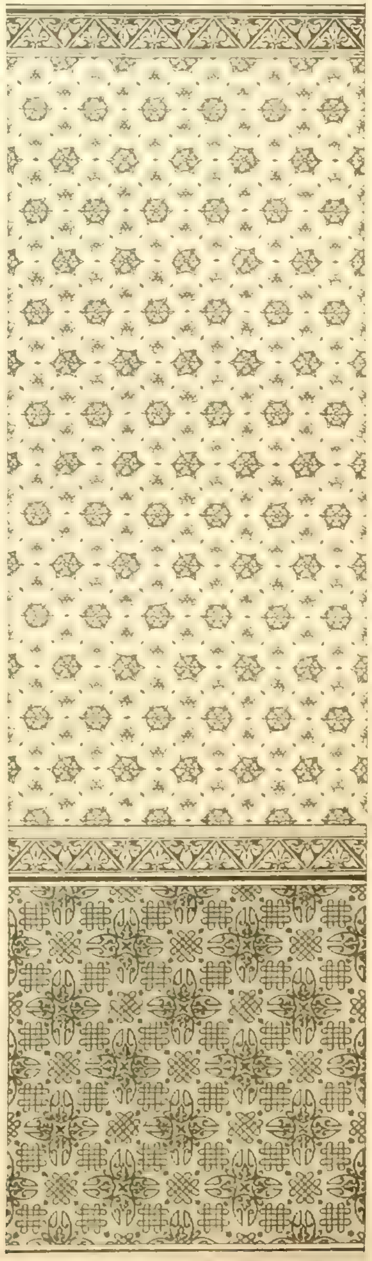

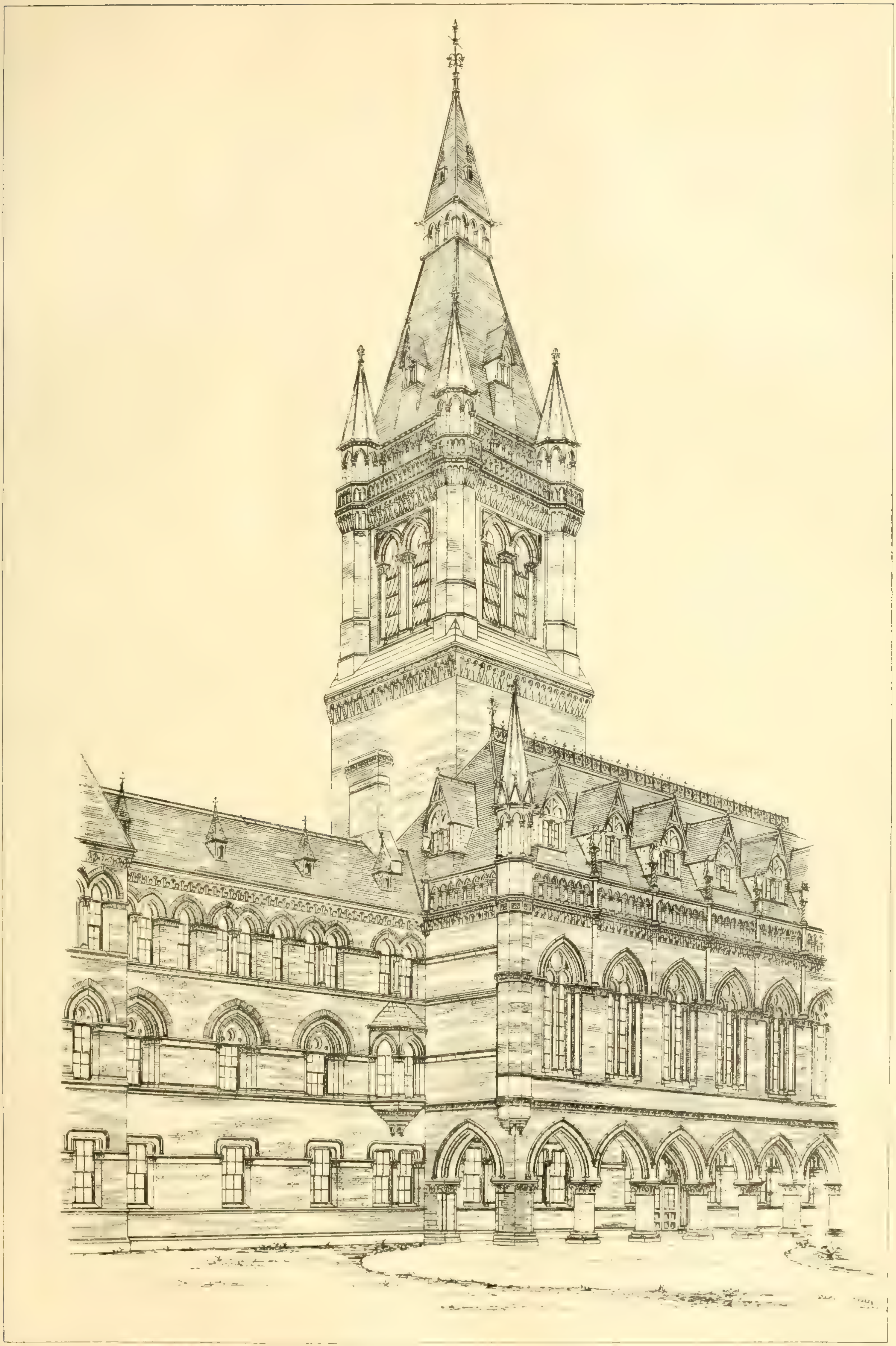

CENTRAL TOWER OF PROPOSED LUNATIC ASYLUM.

ST ANN'S HEATH.

MESSRS CROSSLAND, SALOMONS & JONES, ARCHTS

WALL-PAPERS.

WE give this week a double-page illustration of twenty examples of wall-papers designed by three well-known architects—Mr. W. Burges, Mr. E. W. Godwin, and Mr. Owen Jones. Mr. Metford Warner (Messrs. Jeffrey & Co.) has done wisely in resorting to English architects for new designs. We use this last word in a somewhat conventional sense, for, to be strictly correct, we ought rather to say adaptations of old designs, seeing that, like those designed by Mr. W. Morris (Jason Morris) and the late Welby Pugin, there is hardly a line in these new wall decorations which can be fairly said to be original. It is to Persia, Europe, and Japan we must bow our acknowledgments for the *invention* or development of the highly decorative patterns before us. At the same time, we would not underrate the skill of the adapter. In their generation there are few men more capable of well-doing in all matters of decoration than those whose help Mr. Warner has sought. But, then, what is their generation? It is one of universal adaptation. In our architecture, and in all that relates to it, we have gone the overland route of civilisation, and ransacked every country and nearly every age on the road. The direct way has, naturally enough, furnished the largest contributions. Greece, Italy, France, first of all, and then Germany, Spain, and the East as far as India. Mr. Godwin has gone beyond most people's notions of the boundaries of civilisation, and has added Japan to the list of authorities worth copying. We hope to see this energy of research extended. The great Empires of Russia and China, and the countries north of the Baltic, lie before the art-student (or shall we say art-hunter) almost untouched, and practically unopened; for even the great folio work of M. Mandelgren on the Swedish churches is so very little known that, with the exception of Mr. Burges, we know of no one who has shot over this valuable preserve. Ireland, too, is well worth the serious attention of the art sportsman. In her MSS., her furniture, her tombs, her buildings, and above all in her metal work and personal ornaments, the artist will find much to occupy him. In the *Archæological Journal* (Vol. X.) Mr. J. O. Westwood has given a carefully illustrated paper on that elaborate branch of Irish ornamental design which is so interwoven with all her earlier MSS. As yet, however, no one has gone further. But Mr. Westwood's labours, like M. Mandelgren's, do not appear to have been known to or appreciated by our architects and decorative artists, Mr. Godwin alone excepted. He appears to be perplexed by a divided duty between Ireland and Japan, with an occasional leaning to the Mediæval glories of Europe. The *divided duty*, as we have called it, may possibly turn out to be but one, for we believe Mr. Godwin has somewhere written on the marked similarity in feeling as well as in form between Ireland and Japan in the construction of much of their ornamental design; there is also the same extraordinary skill of manipulation. With that of the Japanese every one who can afford a sixpenny fan is familiar; but it is not so with regard to the skill displayed in the ornamental drawing which illumines ancient books of our own islands. We can fully confirm Mr. Westwood's marvellous assertion when he says: "I have counted in a small space, measuring scarcely three-quarters of an inch by less than half an inch in width, in the Book of Armagh, not fewer than *one hundred and fifty-eight interlacements* of a slender ribbon pattern, formed of white lines edged by black ones." No wonder that there exists a tradition that the decorations in the Book of Kells were executed by angels. One of these diagonal interlacing patterns in the Lambeth Aldhelm only wants the omission of the smallest fraction of a line to become the common diagonal T pattern of Japan, and China, and this it is which Mr. Godwin has enlarged to a useful scale for ordinary wall paper.

Mr. Burges's work is (characteristically enough) much coarser than that of either of his *confrères*. To the broad strong line-drawing of Wilars de Honecort he turns for inspiration, and finds it in the "Têtes de Feuilles," on the fifth and twenty-second leaves of Wilars' thirteenth century sketch book, in their turn, no doubt, adapted from what is called the "antique." We are not quite sure that a repetition of masks is in any place a desirable decoration, and we certainly do not relish the idea of a face peering at us from every part of the room. The snails among the daisies are suggestive of our climate, it is true, but it is questionable whether any one wants this sort of reminder. Indeed, the introduction of any members of the animal kingdom in wall-papers, involving, as it necessarily does, such an amount of repetition, is always dangerous. Even birds, which are the least objectionable, have their difficulties, Mr. Morris's trellis being the only bird pattern we know that is in any way successful. We have not seen the Japanese bird pattern adapted by Mr. Godwin, except in the pattern book, and from this it is next to impossible to judge of the effect in any mass of this, the only *irregular* arrangement we are acquainted with. It may or may not be all right, but if not we would suggest a square trellis to strengthen it and hold it together. In the same spirit we would suggest to Mr. Burges the possibility of his designs being improved by a little more refinement. Of thirteenth century patterns easily adaptable to the purpose of wall-papers, we possess a store in our MSS., &c., which few are more familiar with, and no one is better able to treat, than Mr. Burges. We may add that there is a bird and oak pattern on the coronation chair in every way a charming Mediæval decoration, only awaiting his translating pencil to become a highly successful wall-paper.

With Mr. Owen Jones's designs we seem to have been familiar from our youth, and have almost come to look upon him as the patriarch of the tribe of decorators. To him Persia occupies the same pre-eminence as France does to Mr. Burges and Japan to Mr. Godwin. A well-filled Persian tile is always sure of an enthusiastic reception at his hands, and it is to the Mediæval artists of Ispahan and Tabreez that we, in common with him, are indebted for the most pleasing of those wall-papers to which his name is attached. We are very glad to see that Mr. Jones has avoided in the patterns before us that minute over-elaboration in which he sometimes indulges. Excess in this direction is nearly as bad as excess in coarseness, as we may see by comparing the lower pattern in B with that in G. Putting questions of style out of the question, as a matter of taste we prefer the lower papers at I and D, the upper ones at J and E, and the frieze at H, whilst for division of wall space the arrangements shown at F and at I and J are to be preferred. If low dados must be used the arrangement at H is altogether the best. For pictures, statuary, porcelain, &c.—and most people like to decorate their rooms with one or the other—the paper and arrangement at I is without question the one we should select. But we would warn our readers against forming a hasty judgment of the actual papers from the black and white reductions of our engraving, for the more delicate designs necessarily suffer, whilst the coarser are improved by the loss of colour and *scale*.

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MODERN ARCHITECTS AND THEIR WORKS.—VI.

THE CHURCH ARCHITECT.

TO be a faithful son of the Church, and at the same time to be a good architect, is a condition of things which, so long as the world revolves at its present pace, can only be possible to the strongest men.

It is just a quarter of a century ago that I made the acquaintance of a young architect of more than ordinary promise, full of energy, fond of his art, rather too much given to work, and not without that sense which is so sustaining to a hard worker—the sense of the comic. Tractarianism, as the Anglican revival was then called, had begun its operations in the parish in which he lived, and before long the diligence he had hitherto applied to his art was transferred in a very wholesale manner to the new *ism*. He became a devout attendant at every service; he familiarised himself with fasting, scourging, and hair-shirting, and even his spare time was so given up to the church that he at last entirely neglected his art studies, and, with a miserable enthusiasm pitiable to behold, worked away in Berlin wool at crosses, pelicans, monograms, and lambs, to decorate the borders of pulpit hangings, altar cloths, kneeling mats, and alms bags; Gregorian tones, ceremonial observances, and church millinery, absorbed him until the inevitable "tide in the affairs," &c., came, landing his Anglican priest in Rome, and stranding him in Australia. Change the details, and the story will apply to many a young architect once full of promise, but who, wanting ballast, has been led astray by the mere sentiment of a revival, the real value of which he has never apprehended. The enthusiastic spirit was not, however, all wasted on black letter or Berlin wool. Here and there, at rare intervals perhaps, but present nevertheless, were to be found students of an architecture a trifle in advance of Gwilt's "Encyclopædia," men who were not content until they had unlocked the treasure-house of the middle ages, and learnt how architecture was only, after all, but one of the numerous actors in the great artistic drama of Mediæval life. To the delight an artist would naturally experience as each new treasure of embroidery, furniture, armour, jewellery, &c., dawned upon him, may be traced many of the anachronisms in the best of our modern Gothic works. Thus we have one architect who has always seemed to design as if the yule log was something more than a subject for the Christmas number of the *Graphic*—another, as if noblemen (in their own houses) still wore long dresses heavy with embroidery, bound in by belts joyous with jewels; and another as if it was still a question whether some Albert Edward might not some day withdraw the privileges of Magna Charta. There is a certain boyish romance about all this, no doubt, but in some cases it has degenerated to what may be called trading in antiquities, and the architect, losing what little poetry he may once have possessed, and too wide awake to hold by the sham romance of the nineteenth century, becomes little more than the professional counterpart of the curiosity-monger, satisfied with driving a very good trade among the descendants of those who made Wardour-street a possibility. Out of all this enthusiasm for old things, this harking back forced upon young imaginative minds by the uniform dulness of things vernacular, there can be very little doubt that the architecture of the future will reap much benefit. It has already profited by this archæological enthusiasm, and would continue to make very visible progress were it not for those very church architects to whom it owes so much of its later impetus. So long as any past style of Gothic remained unlearnt, so long as the tracery at Temple Balsal or Herne, or the mouldings at Stone, held their own against all modern designs, so long our church architects wrought in wholesome rivalry; but directly a Scott, a Street, a Butterfield, or a Carpenter has given sufficient attention to the old work to be able to reproduce it faithfully, the rivalry changes its nature, the art, or rather archæological, struggle ceases, the church architect becomes a mere creature of precedents, and the most successful is he who chooses best and copies closest. Church architecture, as now practised, with one or two rare exceptions, is entirely one of models. The competition for Edinburgh Cathedral may be cited as an example. Here most of the designs are of equal merit, and the question becomes merely one of taste, or, perhaps, I should say, prejudice. If we prefer the English regulation number of steeples, there is no reason why Mr. Ross's design should not be accepted for its architecture, and its ritual arrangements are quite equal to any of the others. If, on the other hand, we want a sort of Salisbury *tour de force*, Sir Gilbert Scott is ready to oblige with both architecture and ritual planning, which we may be sure are perfectly correct. If, then, we are to hope for invention or development in architecture, we must put our trust in secular and not in ecclesiastical architects. It is from such designs as Mr. Street's Law Courts and Sir Gilbert Scott's German Parliament House, imperfect as they may be, that development will flow, rather than from stereotyped models of big churches and tiny cathedrals, be they ever such perfect exercises in the thirteenth century schools of Cologne or Chalons, Westminster or Wells. Modern secular wants oblige the architect, from lack of precedents, to rely on himself for general composition and for many of those details which arise from the necessity for abundance of lighting, heating, ventilation, &c. And the church architect finds, when he has to deal with these things, that he has rusted in his groove, and is unequal to the demand that is made on him. No one who will take the trouble to examine the secular buildings of men much accustomed to ecclesiastical work, and who have produced very fair churches, can fail to recognise the truth of what I have just said, for there are few grooves in this groovy world so deeply worn and so dangerously rusty as those into which the fashion of a day has dragged the ministering artist. Let any one ask what influence these church architects have exercised on the life of the people. The answer comes to us from every new suburb, and an architecture that is only for churches is too like a religion that is only for Sundays.

E. W. G.

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NORTH OXFORDSHIRE ARCHÆOLOGICAL SOCIETY.

THIS Society had an excursion on Wednesday, the 25th ult., under the guidance of the Rev. Philip Hookins, the Secretary. The first place visited was Horley Church, a large and interesting edifice, with central tower, nave, two aisles, and long chancel, in the latter of which are placed several ancient monumental slabs, said to be of genuine Norman work. Frescoes have been discovered on the walls, one on the north being a large painting of S. Christopher carrying the infant Christ through a stream, in which an aged man and a youth are depicted angling. The artist, in his endeavour to paint a dog-fish, has given it "dog's ears." Another fresco is one of S. Etheldreda, the patron saint, whose image in marble or alabaster is in a niche surmounting the south porch. The Rector discovered also a fresco of Satan bearing away lost souls, followed by the seven deadly sins. The large Church of Hanwell was next visited. This is a fine building, but greatly in need of restoration. The chancel floor is raised to an unusual height, to make room for a spacious vault below, and this arrangement obliterates much of the piscina, sedilia, and altar-tomb, with recumbent full-length figures of Sir Anthony Cope and one of his two wives, erected in 1611. An immense altar-tomb in the south aisle has on its top a slab of forest marble, 9ft. long by 4½ft. wide, but has no inscription. The remains of Hanwell Castle, now a dwelling house, were thrown open to the visitors. These are of brick, relieved with stone, and consist of a large square, containing good and airy rooms, and two rather lofty side-turrets, in one of which is a spiral staircase, which the visitors ascended. The other turret is fitted up in part as a dressing-room. The moat has been levelled, but a pair of tall gateway pillars and a coped wall remain as the boundary of a modern stack-yard. The carving of the capitals of the columns dividing the nave and south aisle of the church contain figures of four musical performers, one on the bag pipes, another on the single pipe, a third on the double pipe, and a fourth on the "crowd," the precursor of modern violins. A short halt was made by the excursionists at Great Bourton, to visit the neat little church erected, or rather re-erected, on the site of an old chapel dedicated to S. Michael, desecrated in the time of Edward VI., and of which Beesley wrote thirty years ago, that "it was an interesting relic of other days, most melancholy to look upon." At the magnificent Church of Cropredy the visitors had the pleasure of hearing from Dr. Wood a *resumé* of the secular history of the church and its appurtenant chapelries; and at the historic scene of Cropredy Bridge the same gentleman explained the position of the rival forces who met in hostile array there on the 29th of June, 1644. Miss Loveday exhibited a gilded whistle dug up on the site of the battle; it has a chain, is perfect, and nearly resembles a modern rifleman's whistle.

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LEGAL INTELLIGENCE.

Building Societies.*—The certified rules of a permanent benefit building society stated that the society's objects were "to raise a fund for the purpose of enabling its members to purchase and, to erect buildings thereon, to provide means for the profitable investment of small savings, and in cases of accidental death to relieve the widows and families of deceased shareholders by adding the interest and estimated profits of the current year on the withdrawal of their shares at the time of death." The original rules contained no powers of borrowing. Subsequently the rules were altered, so as to empower the directors "from time to time to borrow, for the purposes of the society, such sums, at such rates of interest, and under such terms and conditions, as they might think proper and expedient." This rule was duly certified by the barrister. Held, that under this power the directors could only borrow for the purposes expressly mentioned in the original rules of the society, and that money lent to the society by way of deposit at interest, and used for an unauthorised purpose, could not be recovered by the depositor. But where the loan had been secured by a deposit of mortgage deeds executed in usual course by the members to the society to secure the advances made to them, held, that the official liquidator to the society was not entitled, without payment of the loan, to deprive the lender of his securities.—In re Durham County Permanent Benefit Building Society, Davis' case, Wilson's case, V.C.B. The official liquidator of the society having appealed from the decision in Wilson's case (see preceding case), the Lords Justices declined to entertain the appeal, on the ground that an agreement had been entered into between the official liquidator and the parties claiming the charge, to the effect that the rights of the parties should be fully and effectually determined in a summary manner by the judge acting in the matter of the winding-up of the society.—In re Durham County Permanent Benefit Building Society, Ex parte Wilson, L.J. The provision of the 199th section of the Companies Act, 1862, that an unregistered company neglecting for the space of three weeks after demand in writing to pay a debt shall be deemed unable to pay its debts, held not to apply to the case of a building society where a debt was due to a withdrawing member in respect of a share which he had given notice to withdraw. Held, further, that the claim of such withdrawing member ought to have been referred to arbitration, pursuant to the rules of the society, and the 29th section of the Friendly Societies Act (10 Geo. IV., 66 c. 56), instead of being made the ground of a winding-up petition.—Re Planet Benefit Building Society, M.R.—20 *Weekly Reporter*, 935.

Contract.*—A builder, relying on rough estimates furnished by an architect, sent in a tender for the erection of a house and premises for £13,500. He afterwards signed a contract and specification, according to which he agreed to complete the house premises for the same sum. There was a proviso in the contract to the effect that all alterations and additions to be made should be authorised in writing by the architect. The works, however, were carried out on a scale largely in excess of the estimates, and the house and premises when completed were found to have cost about £25,000. The builder produced evidence to show that he signed the contract when in a feeble state of health, and contended further that he was induced to do so by the conduct of the architect amounting to misrepresentation. He prayed that the contract might be enforced as far as its provisions had been complied with, but that it might be rectified as far as the works were in excess of the estimates. Held, that the builder was bound by the strict terms of his contract; but that works not included in the specification must be paid for according to their true value, and an account directed as to what was due to the plaintiff accordingly.—Kimberly *v.* Dick, M.R.—20 *Weekly Reporter*, 49

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SCHOOLS OF ART.

Burslem.—The annual meeting of the Wedgwood School of Art was held at Burslem on Monday week. The report of the head-master stated that the studies have been of a steady, progressive character, as evidenced by the number of works sent up to London for examination, and the increased value of the awards. The evening classes continue to be well attended, with the exception of the female class. The ladies' day class is in an unsatisfactory state with regard to numbers. The science classes have worked well; the students are regular, attentive, and industrious. At their examinations in building construction and machine drawing all those who presented themselves passed. During the light evenings previous to the vacation a class was commenced for drawing flowers, &c., from nature. It was successful, and will be resumed at the proper time. With regard to colour studies of this kind not much is done at present, as the students have not the requisite daylight time to give, their avocations not permitting it. All that were eligible (3) were recommended to the Department for free studentships and were appointed for one year. The modelling class has been satisfactory; seven students sent up works to London, and five prizes were awarded by the examiners. The Worshipful Company of Plasterers, London, give a first and second prize for modelling, and a first and second prize for a design for room decoration. The two first prizes were taken by the South Kensington school. The second prize for design has been obtained this year by Mr. Joseph Parr, a student of this school. Twelve schools competed, sending 27 works.

Leeds.—The annual distribution of prizes and certificates to the successful students of the Leeds Schools of Art and Science took place on Monday evening in the Picture Gallery of the Mechanics' Institution. Mr. J. O. Dayson, secretary of the Institution, read the following report:—"The committee are pleased to record the increased success of the school during the past year. The following are the returns of the School of Art for the past year compared with 1871:—Number of pupils under instruction in the School of Art for the quarter ending 30th September, 1871, 326; 1872, 358. Number of pupils who submitted works to Art Department, 1871, 356; 1872, 411. Number of works submitted for examination to the Art Department, 1871, 2,592; 1872, 3,196. Number of sets of works which obtained the mark 'satisfactory' from the Art Department, 1871, 41; 1872, 46. Number of third grade prizes awarded by the Art Department, 1871, 9; 1872, 13. Free studentships, 1871, 1; 1872, 5. School of Science.—In the School of Science the following subjects are taught:—Practical, plane, and solid geometry, machine construction, building construction, mathematics, inorganic chemistry, organic chemistry, theoretical mechanics, and metallurgy. Number of individual pupils during the session 1871, 106; 1872, 129. Number of students who obtained certificates, 1871, 58; 1872, 62. Number who obtained Queen's prizes, 1871, 19; 1872, 24. Number of certificates obtained, 1871, 118; 1872, 121. Number of gold medals, 1871, 0; 1872, 1. Number of silver medals, 1871, 1; 1872, 1. Number of bronze medals, 1871, 0; 1872, 1. The gold medal in organic chemistry was awarded to John Robinson, and the silver medal in organic chemistry was awarded to T. T. Severs, the two highest positions in this subject in the kingdom. The silver medal last year in the same subject was taken by a pupil in these classes. The bronze medal in applied mechanics was awarded to J. N. Wardle. A. R. Williss has obtained a scholarship at the Royal School of Mines of £50 per annum for three years, and J. C. Jefferson, who last year obtained a School of Mines scholarship, has, after one year's study at the school, been awarded a Whitworth Scholarship, value £100 per annum for three years. This is the second student from this institution holding a Whitworth Scholarship."

North London School of Art.—The distribution of prizes from South Kensington gained by the members of this school took place on Wednesday evening at their room in Sandringham-road, Kingsland. Mr. Holms, M.P. for Hackney, distributed the rewards to the successful students. Eighty-seven students took prize certificates in the second grade and eight in the third grade, excluding one art scholarship by Mr. Charles Swinstead. In the department of science twenty-one were successful, making a total of 117. The report (read by Mr. William Iliffe, the hon. sec.) stated that the school had been opened in 1869, and from that time the aggregate number of students had been 495. In 1869 there were 54; in 1870, 110; in 1871, 162, and the same number in the present year. Mr. Swinstead, the head master, having spoken, Dr. Bindle proposed a vote of thanks to the committee, the secretary, and the head master, to which Mr. Iliffe briefly replied. A cordial vote of thanks to Mr. Holms for presiding was then passed, and the proceedings terminated.

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* From the *Solicitors' Journal*.

West Cowes.—The first annual meeting of the West Cowes School of Art was held on the 30th ult. The class was only started in October last, and the session lasted until April of this year. Fourteen students joined the class, and five of these were students only during a portion of the session. An examination in art drawing took place in April last, when nine students presented themselves, and seven succeeded in passing one or more subjects creditably. To those who were classed by the examiners as excellent were awarded certificates of merit. Three students went into the building construction examination, and one of them obtained a 1st class and Queen's prize. Of the whole class five passed in freehand drawing, three of the number being excellent; and four in geometrical drawing, one of which was excellent. The Department of Science and Art have paid on these results, and on the works sent up to South Kensington for inspection, a total amount of £13 7s. These results are so satisfactory that although this is a new class it can hardly be expected to do better in future years, except it be in the increased number of students attending. The committee purpose to open a ladies' morning class at the reading-room, for lessons in drawing and painting.

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COMPETITIONS.

Blackpool.—At the last meeting of the Blackpool Local Board, one of the members said that as plans had been advertised for and premiums given for the three best sets of plans for a new market, they would now have to decide whether or not any of the successful plans be carried out, and if so which of them.—Mr. Hardman said that he thought none of the plans ought to be carried out, for if they commenced to build it would cost them £10,000 instead of £7,000. If they made any alterations he should say knock down the east wall of the present market and add the shambles to it, and put up pillars to support the roof. Then cross the street, clear the land, and cover it with something after the manner of Smithfield Market, or the railway station platform. They would thus remove a great eyesore from the south side of West-street, and increase the market accommodation, so as to last for some time. The ratepayers would be better satisfied with that course than by expending £10,000 or £11,000 upon the present site. He merely suggested this as the outlines of what he thought would be suitable. He moved that none of the three plans be carried out.—The motion was seconded and carried unanimously. It was then proposed to cover the ground with a roof supported by pillars, and it was suggested that it should be done by Mr. Gorst, the surveyor to the Board.—Mr. Birch said he thought Mr. Gorst was paid for acting and surveying and collecting the rates. They might be putting too much upon him by wishing him to prepare the plans, as he perhaps could not do both.—Mr. R. W. Braithwaite suggested that if Mr. Gorst was unable to draw out the plans, they could allow those who had competed for the market plans to compete in this case also. They might advertise for plans to be sent in, and appoint a committee to carry out the work, to whom the designs might be submitted.—A discussion ensued about who were to be allowed to send in plans in the event of Mr. Birch's proposition being passed, and it was finally decided that the following gentlemen might do so if they thought proper:—Mr. Wade, jun., Mr. Worthington, jun., Mr. Mather, jun., Messrs. Speakman, Son, and Hickson, Mr. Knowles, and other architects resident or working in Blackpool.

Llanaelhaiarn School Board.—The above Board, at a meeting held on the 30th September for the purpose of selecting the best design sent in for their school and master's residence, unanimously agreed to accept the designs submitted by Mr. Walter W. Thomas, architect, Liverpool; and also decided to appoint Mr. Thomas as their architect.

Oban.—The committee of the parish church appointed to make a selection from the 34 plans that were received in connection with the proposed new church have decided to accept the plan of Mr. David Thomson, of Glasgow. The proposed edifice will cost about £3,000, and is to be proceeded with at once.

Surrey New Church.—The committee for the erection of this building (Rev. Newman Hall's) have approved the general design as prepared by their architects, Messrs. Paull & Bickerdike, of London. It is intended to provide a church capable of accommodating 2,000 appropriated sittings, and a lecture-hall for 800 adults, with numerous vestries and class-rooms and other apartments attached. The style adopted is English Gothic of the Geometrical period, and the structure will be faced with stone throughout. At the point of junction of the Westminster and Kennington-roads a tower and spire will be erected about 200ft. high.

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ARCHÆOLOGICAL & ARCHITECTURAL SOCIETIES.

Chester Archæological Society.—An extraordinary meeting of the Chester Archæological, Architectural, and Historic Society, was held in the Chapter House of the Cathedral, on Thursday week, when the Rev. Canon Blomfield delivered a lecture entitled "Remarks on the Episcopal Palace and its History." The interest of the lecture was greatly increased by the exhibition on the occasion of a series of portraits of former bishops of the diocese, lent by the present one, and by the special illumination of the curious vaulted chambers under the old palace, together with the Abbot's hall, and also the fragment of the pedestal of S. Werburgh's shrine, recently discovered during the work of the restoration. At the close of the canon's remarks, the party went through portions of the Cathedral precincts. They included the old Abbot's wine and beer cellars, the Abbot's parlour, the lately discovered remains of the shrine of S. Werburgh, and the extensive crypts and passages which served as the means of private communication between the Cathedral and the once-adjacent monastery. These vaulted passages were lighted up for the occasion, and provoked much interesting discussion. Canon Blomfield explained, as the party passed from one to another of them, the leading features of it, and the probable uses which it had served.

Leicester.—At a meeting of the Leicestershire Archæological and Architectural Society, on Monday week, Mr. Hunt exhibited rubbings and sketches of incised stones found at Helpstone, near Market Deeping, sent by the Rev. J. Legh Campbell, M.A., who stated that he had read Mr. Hunt's paper on Thurnby Church and the incised stones, and thereby was induced to write to him upon the subject. One stone, with cross and diagonals incised on both sides, with circular top, was found when rebuilding the church tower; the other stones whilst putting in an underground flue to warm the church, one used as a paving (flooring) stone, incised site downwards, and probably cut square to fit the floor. Many head-stones have been found at Helpstone, but in every case the carving has been in relief—not incised. They are very similar to the Thurnby stones.

London and Middlesex Archæological Society.—This society has issued a report of its evening proceedings for the session of 1871. The first paper is by Mr. Alfred White, F.S.A., and describes the crypt which, until a year or two ago, still existed at the junction of Fenchurch-street and Leadenhall-street. The crypt is usually considered to be that of the Church of S. Michael, and Mr. White's paper is illustrated with a *fac-simile* of John Carter's etching of the crypt, sketched in 1784, also two stone bosses from the crypt, sections, and plans. The period of the crypt is placed at the time of Richard II., since which both Fenchurch and Leadenhall-streets have retained their present course. Strange to say, the crypt was not known to Stow, though, it is believed he occupied the house immediately above it. Next is Mr. C. Baily's paper on the painted glass of Long Melford Church, Suffolk, with *fac-simile* coloured drawings. The antiquities lately found in Queen Victoria-street, near Barge-yard, and close to the ancient Walbrook, are among the other subjects. The society held its annual general meeting at West Drayton, near Uxbridge, when two papers by Mr. A. D. White were read—one upon the architecture and records of the parish church, and the other on the site of Old Drayton House, where the Pagets kept great state for some two centuries after the Reformation. Mr. A. Hartshorne read a paper at Harmondsworth on the great barn, in which it was stated that the barn, believed to be nearly 500 years old, was originally built to house the grain that Harmondsworth, as an inferior cell of the Benedictine order, used to store up for its superior lord, the Abbot of Rouen, to whom the parish had been granted by William the Conqueror. The barn is one of the finest in the kingdom, and measures 200ft. long by about 40ft. broad, and 40ft. high. Mr. White showed the various parts of the building were of different dates, and traced the gradual alteration and enlargement from the Norman age, or, possibly, an earlier age still, which witnessed the erection of the tower and the south doorway, down to the extensive alterations made in the north aisle and its arches, and also in some of the windows of the entire fabric, by the hands, as he concluded, of William of Wykeham.

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Building Intelligence.

CHURCHES AND CHAPELS.

Acton.—On Tuesday week the Church of All Saints, South Acton, London, was consecrated by the Bishop of Dover. The church, which is built from the designs of Messrs. Adams & Kelly, architects, of Leeds, comprises clerestoried nave, north and south aisles, chancel, with apsidal termination as organ chamber and vestry. At the south-west bay of the south aisle rises a tower, 22ft. square, to a height of 180ft. The building, which will accommodate 800 persons, has cost £5,500.

Belgium.—On the 24th of September the corner stone of an English church in Spa was laid by the Bishop of Ely. The building of the church, which is to cost £5,000, and to which the Belgian Government gives 60,000 francs, and the Commune of Spa the site, at a cost of 40,000 francs, is entrusted to Messrs. Blackmore & Morley, contractors, Haggerstone-road, Messrs. Habershon & Pite, of Bloomsbury-square, being the architects.

Bristol.—The corner stone of S. Silas' Church, Bristol, was re-laid on Wednesday. The church was erected in 1867. Unfortunately, in February last an alarming subsidence took place, rendering it necessary that the church should be pulled down and rebuilt. The new church will be of precisely the same dimensions as its predecessor, with the exception of the height, which will be slightly reduced. A bell turret will be erected in the western gable, and in the interior arches are devised to relieve the walls of the weight of the roof. Owing to the shifty nature of the ground, it has been found necessary to build on piles of wood. The architect is Mr. J. Neale, and the contractors are—for the building, Mr. J. P. Stephens, and for the piling Mr. Mereweather. Mr. C. Davis is clerk of the works.

Edinburgh.—The Tron Church, Edinburgh, was reopened on Sunday last. The west window has been filled with stained glass. The subjects are: Christ raising Lazarus, the Last Supper, the Agony in the Garden, the Crucifixion, the Marys at the Tomb, and the Ascension. In the upper tracery of the one window is the Agnus Dei in the centre, with angels in the side-lights, while the tracery of the other has in the centre the pelican and angels in the side-lights. The subjects above mentioned are filled with ornamental work. The subjects are executed in the Mosaic style of glass painting. The walls of the church have been painted in a tint of neutral green, diapered with borderings of brown and dark green. The ingoings and facings of the windows are of a warm drab colour, and these are also diapered with borderings in keeping with the glass in the windows. Messrs. Ballantine & Son were employed in the decoration of both walls and windows.

Honor Oak.—On Thursday week the foundation stone of S. Augustine's Church, Honor Oak, was laid. The new building will be in the Early English style. At present it is intended to contain only one aisle, but a second will be added, together with a tower, when funds are forthcoming. It will accommodate 390 persons, and the estimated cost is £3,200. The architect is Mr. Oakley, of S. James's-square, and the builders are Messrs. Roberts, of Islington.

Knaresboro'.—The parish church of Knaresboro' was reopened last week. The roof of the nave and transepts has been raised to its original pitch, and the dressed stone walls—which had been picked with axes to give a hold for plaster—have been re-dressed. Including the stained glass windows, which cost about £1,300, the entire cost of the restoration amounts to about £6,000. The architect is Mr. E. Christian.

Leith.—S. Andrew's-place United Presbyterian Church has been restored and redecorated. The repainting has been executed by Mr. Paxton, of Edinburgh. A brown tint on the walls gives an air of warmth, while affording a background for the work of the decorator. The panels of the ceiling are painted in pale blue with gold stars, and along the intersecting beams is carried a band of guilloche ornament. The windows are encircled with bands of diaper-work. The old pulpit is replaced by one of more modern style, and the wall behind is diapered and picked out with gilding. Two windows have been filled with stained glass, and a mural monument has been erected to the memory of the late Dr. Smart, in the lobby of the church. This work was designed by Mr. Brodie, R.S.A. A new school building, designed by Mr. Paterson, of S. Andrew's-square, Edinburgh, is being erected in close proximity to the church, capable of comfortably seating about 300 persons.

Liverpool.—The foundation stone of a new Presbyterian Church was laid at Liverpool on Saturday. The church will afford accommodation for 810 persons. The building will be in the Decorated style of architecture, and will consist of a nave, two transepts, a vestibule, space for stair for future gallery, an engaged tower and spire rising to a height of 127ft., and an organ chamber. At the rear of the church will be a lecture-room capable of accommodating 400 persons, two class-rooms, a minister's vestry, porch and yard. The roof is to be open-timbered, and of peculiar design, forming as it were externally a nave and aisles, but it is one span internally. The external facing of the church will be of shoddies, with Stourton yellow stone dressings, and the entire cost, inclusive of the land, will be about £5,800. Messrs. John Parker & Son are the general contractors, and the architects are Messrs. T. E. Murray and G. H. Thomas, Liverpool.

Manchester.—The foundation stone of a new Baptist Chapel was laid at Rusholme, Manchester, on Wednesday. The frontage of the building will be 115ft., and the total depth 77ft. The principal feature in the front elevation will be a tower 70ft. high, with a slated high-pitched roof, surmounted with an iron cresting. Provision is made for the accommodation of about 25 students. The ground floor contains a dining-hall, lecture-hall, class-rooms, study, president's room, and servants' department. Mr. Henry Pinchbeck, of Norfolk-street, Manchester, is the architect; and Mr. James Herd, of Clarence-street, Cheetham, is the contractor.

Welford.—The church of S. Mary-the-Virgin, Welford, was reopened on Tuesday week after restoration, at a cost of £2,300, by Mr. E. F. Law. The north aisle has been rebuilt. A new arcade in the Decorated style has been inserted, having carved capitals, with natural characteristic foliage of the period. The north aisle at the west end is also carried beyond its original position, and the extension is converted into a small sacristy. The south arcade was considerably out of the Perpendicular. It was a beautiful specimen of Early English, and, in order to preserve its character, it was taken down stone by stone, and re-erected in its original position. The west gallery has been removed, and the tower arch opened and restored. The nave walls have been restored. The roofs to nave and aisles are entirely new, and are of pitch pine. The church has been reseated in oak throughout. The entrance doors on the north and south side have been made from beams out of the old roof, and are worked on small panels. The old porch, which was entirely destitute of character, has been replaced by a Decorated one.

BUILDINGS.

Darlington Fever Hospital.—At a meeting of the Darlington Town Council, held on the 3rd inst., the report of the Hospital Committee was adopted, and it was resolved to erect the building forthwith, at a cost of £9,000. The architect is Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, to whom the first premium was awarded in March last.

Dumfries.—The Crichton Royal Institution for mental and nervous invalids of the middle and higher classes, which was partly constructed in 1839 from a design by Mr. Burn, at a cost of fully £50,000, has just been completed according to a plan furnished by Mr. W. L. Moffat, architect, Edinburgh. The additional expense now incurred brings the entire outlay up to £90,000. The entire building is in the Italian style, its doors, windows, perforated parapets, and other features of ornamentation being copied from the designs of Palladio. Airy galleries running up the middle of each division of the building have dormitories on one side, with elegant parlours and sitting-rooms for the richer class of patients, and on the other side large open balconies for exercise when the weather renders this less convenient out of doors. One of the chief interior additions is a grand recreation hall over the principal staircase.

Edinburgh.—The foundation stone of the new Watt Institution and School of Arts was laid at Edinburgh on Wednesday. The style of the building will be Italian, and it will be two stories in height, except at the west end, where there will be a pavilion carried one story higher. The south front will be rusticated on the ground floor with balusters under the first-floor windows; while the second-floor windows will have architraves, trusses, and cornices, and the pavilion will have pilasters at each side and Decorated windows. Over the first-floor will be the main cornice, furnished with dormer windows, which are intended as a feature in lighting the large lecture hall. The main entrance will be at the west end, under the pavilion, and will be approached by a projecting porch supported on pillars. The porch will be crowned with the statue of James Watt, after Chantrey's model, which at one time decorated Adam-square. The main entrance will lead to a spacious hall and grand staircase, from which access will be had to the lecture and class-rooms, directors' room, library, masters' room, and keeper's house. The principal lecture hall will be 88ft. long by 33ft. broad, and will accommodate 500 persons. Another hall for lectures and large classes will be 34ft. long and 33ft. wide, and the remaining accommodation will consist of a chemical class-room, 33ft. by 23ft.; a chemical laboratory and apparatus-room for mechanical philosophy; and two spacious class-rooms for general purposes. The architect for the new institution is Mr. David Rhind, F.R.S.E., Great King-street; and the contractors are Messrs. David Sutherland & Son, Edinburgh.

London.—New provision warehouses, on an extensive scale, are now in course of erection in Charterhouse-street. The front is of white brick, with stone dressings. The ground floor has two gateways, and is rusticated. The first and second floors are four-lighted, with sunken-stone labels in intaglio over the windows. The windows of the top floor are divided by iron composite columns, beyond which is a cornice. Mr. Lewis H. Isaacs, of Verulam-buildings, Gray's Inn, is the architect.

London.—The eastern end of Messrs. Meeking & Co.'s premises, in Holborn, is now so far finished that one may judge what the effect will be when the western end is erected, the range of buildings being intended to extend from Holborn-circus to Fetter-lane. The style of the new portion accords with that of the old—that is, there are four floors above the ground floor, with a cornice and balustrade beyond, and two dormer windows in the circus portion. The corner piers are rusticated, and the first and third floors have pediments to the windows, the front ranges of which now number nineteen on each floor. These buildings, when completed, will be unsurpassed by those of any drapery establishment in London, and second in extent in the country only to Compton House, Liverpool.

Stirling.—The New Commercial Bank, which occupies the site of the old Eagle Hotel, at the corner of Murray-place and Friars-street, was opened on Monday week. The style is Italian, the ornamentation being chiefly fenestral, with a fine entrance-door from Murray-place. The telling-room is 34ft. by 20ft. Mr. David Rhind, Edinburgh, is the architect of the building.

SCHOOLS.

Halifax.—At the last meeting of the Halifax School Board the "Sites and Buildings" Committee reported that fifteen tenders had been received for the works required in the alteration of Sion Day School, and recommended the following to be accepted:—Mason work, Mr. D. Garnett, £169 10s.; joiners' work, Messrs. Bradbury & Sutcliffe, £119; plastering, Mr. James Ambler, £23; plumbing, Mr. John Naylor, £16; painting, Mr. Jonas Binns, £15. The committee also reported that nine designs and plans had been received for the Queen's-road Schools, and that they gave the preference to the design marked "Meno." It was resolved that this design should be accepted, and on opening the envelopes it was found that "Meno's" design was from Messrs. Horsfall, Wardle, & Patchett, Halifax.

Huddersfield.—On Saturday last the foundation stone of a new Wesleyan school was laid at Huddersfield. The building will accommodate 1,100 children. The cost will be over £2,000. Mr. W. Cocking, of Huddersfield, is the architect.

Oxford.—The foundation stone of the new schools for the parish of SS. Philip and James, Oxford, was laid on the feast of S. Michael and All Angels. Messrs. Hugall & Bruton are the architects, and Mr. James Walker the builder. The school will be built of brick, with stone dressings, the room being lighted by two three-light windows and a large two-light one, with a quatrefoil in the head, the gable being surmounted by a stone bell cot, terminated by a metal cross. The room will be 46ft. long and 18ft. wide. The cost of the building will be about £500.

S. Saviour's New Schools, Leeds.—On Wednesday the Bishop of Brechin laid the corner-stone of schools that are to be built in the parish of S. Saviour, in Cross Green-lane, Leeds. The style of building is the plain Gothic, from designs by Mr. D. Dodgson, architect, 18, Park-row, Leeds. The accommodation will be for 220 children, and the schools will be well heated and ventilated, and contain necessary lavatories, conveniences, &c. The total cost is estimated at about £1,150, towards which the sum of £800 has already been subscribed.

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NEW PATENTS CONNECTED WITH THE BUILDING TRADES.

834. P. J. Ekman, Stockholm, "Window-sashes and frames."—Dated 19th March, 1872.

The novelty in this case consists in forcing the upper sashes of windows against the parting beads of the window frames, by means of an inclined plane fixed to the said frame outside the sashes; in fixing a strip of indiarubber between the meeting rails of sashes, and in adding a flange or shoulder to the movable bar or sash fasteners.

2741. W. R. Lake, London, "Chimneys and fireplaces.—A communication.—Dated 14th September, 1872.

The said invention relates to the combination of cast iron or other metal chimneys with fireplaces and other ventilating shafts, in such a manner that the same can be adapted for heating and ventilating houses, and other buildings and railway carriages, and for other like purposes. The inventor uses a sectional metallic chimney with branches and ventilating shafts in combination with dampers. The ventilating-shaft forms a guard and air space between the chimney and the floor or ceiling, and is arranged to take vitiated air from the room and deliver it into the chimney. The inventor employs basket-grates with a water-back, having recesses concentric with the said grates, to adapt the latter to be shaken on a vertical axis. The fire-grates constructed as described have doors to fold or slide.

761. S. Deards, Harlow, Essex, "Apparatus for heating water for warming conservatories, &c.—dated 13th March, 1872.

The chief feature of novelty in this apparatus is a close coil of piping arranged above a grating in a cylinder or other close structure, so as to form a jacket to the fuel upon the grating. This coil is in communication with the ordinary flow and return pipes for the hot water for warming the building. The cylinder has an ordinary air inlet and a flue to carry off the products of combustion.

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STATUES, MEMORIALS, &c.

Proposed Monument to General Lee.—A movement has been commenced in this country in aid of a monument about to be erected at Lexington, in honour of General Robert E. Lee. The monument will cost some 15,000 dols., and a Virginian artist—Edward P. Valentine—is the designer and modeller. It is in the form of a sarcophagus, surmounted by a full-length figure in a reclining posture, with drapery enshrouding the body. The monument is being prepared in Carrara marble.

Liverpool.—A monument has been erected over his grave in the Smith-down-lane cemetery to the late Mr. John Perris, who for more than fifty years held the position of librarian to the Liverpool library. The design is that of an old Roman altar, and it occupies the head of the grave, which on the other three sides is enclosed by a bold curb. The material is Yorkshire stone. A raised slab of polished granite contains the inscription. The principal stone slightly tapers to the top, and springs from a deep moulded base, on one side being inserted the raised panel already mentioned. The cornice is enriched with deeply carved mouldings, and surmounted with a carved representation of an open book. The design was voluntarily contributed by Mr. E. A. Heffer, architect, and the work has been carried out by Mr. Alfred Norbury, sculptor.

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The Conservative Land Society.—At the eightieth quarterly meeting of this society, held on Monday, the report of the Executive Committee stated that the receipts for the quarter were £36,972 7s. 10d., and for the year £116,019 10s. 1d., and the grand totals to Michaelmas, 1872, £1,835,393 9s. 8d. The total withdrawals since the formation of the society (1852) were £491,430 8s. 8d., and the last share number issued to Michaelmas was No. 37,669. The reserve fund amounts to £10,500. The members elected as auditors, Mr. W. H. Clemow, manager of the Dudley and West Bromwich Bank, West Bromwich, and Mr. James Goad, land and house agent, 287, Essex-road Islington; and the Executive Committee appointed Mr. Thomas Russel, public accountant, 8, Leadenhall-street. E.C., and Mr. Newnham Winstanley, 42, Orsett-terrace, as their two auditors. The report concluded by calling the attention of the shareholders to the fact that on the 7th ult. the twentieth anniversary of the society's commencement was completed, and that it has now entered on the twenty-first year.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

TERMS OF SUBSCRIPTION (Payable in Advance).

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Cases for binding the half-yearly volumes, 2s. each.

TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

NOTICE.

The time for sending in the drawings for the Building News School Planning Competition is extended to the 30th of November, 1872. For particulars, see Building News, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

Received.—W. M. & Co.—B. & Co.—H. W. W. & Son.—C. B. A.—C. H. & Co.

E. H. B. and W. B. C.—We cannot answer any more questions in reference to the school planning competition, as it might be unfair to those who have finished or commenced their plans.

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Correspondence.

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PLUMBER'S FURNACE.

To the Editor of the Building News.

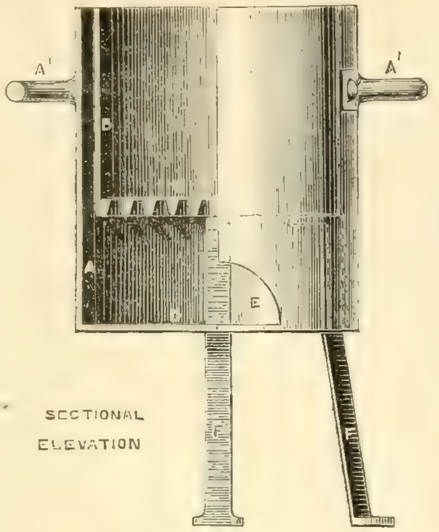
Sir,—I trust you will consider the accompanying letter and illustration, although perhaps rather late in the day, as worthy of a place in your paper. The numerous fires which have occurred recently, and which have caused the destruction of, or serious injury to, many noble public buildings, ought to arouse in the minds of all practical men an earnest desire to do their utmost to devise some means of putting a stop to such fearful contingencies. It has been suggested, and probably with great reason, that the plumbers' coke furnaces used in repairing roofs are frequently the occasion of these disasters. It cannot be denied that the plumbers' furnaces at present used are most awkwardly constructed. I subjoin an illustration of a plumber's furnace used in these parts, and frequently on board ship, where it is always supposed there is greater danger. I have sketched my illustration from the furnace used by Mr. J. W. Ackfield, a very intelligent and experienced master plumber in this town, and I am indebted to him for several of the improvements I have suggested. It will be seen at a glance how liable such an ordinary furnace is to upset, from the centre of gravity being carried so high. I have endeavoured to obviate this difficulty in my improved furnace by considerably lowering the centre of gravity. I have also endeavoured to diminish danger by fitting a cover to the furnace, and a guard to the ash-pan. The cost of the improved furnace, if a number were made, would be only 10s. more than that of the ordinary furnace, and at the same time it would be perfectly safe. The plan and working of both furnaces will be understood by the description and letters attached.

At some future time I hope to give a description and illustration of a soldering iron, which will work without any furnace and without any solder if required.—I am, &c., Charles Turner.

12, Four Posts Hill, Southampton, October 7.

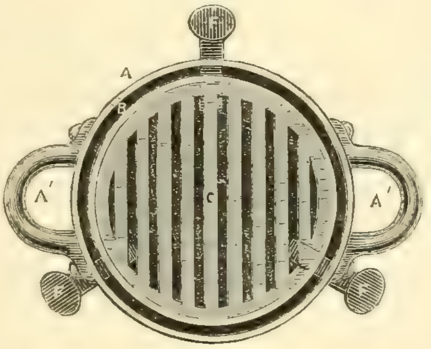
DESCRIPTION.

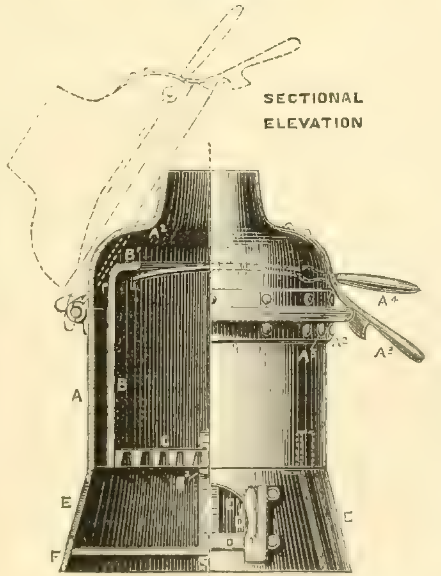
Ordinary.—A, outer case; A¹, handles to lift furnace; B, inner case; C, hearth or grate; D, ash pan; E, cleaning hole; F F, legs or standards. The action of this furnace is very simple. The fire is lighted upon the hearth C, the melting pot and soldering irons being introduced from above. The draught is through the bars of the grate and through the spaces between the inner and outer casing.



SECTIONAL ELEVATION

PLAN





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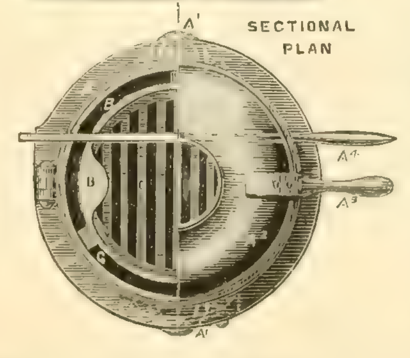

SECTIONAL PLAN

Improved.—A, outer case; A¹, handles to lift furnace; A², cover to furnace; A³, lever handle and spring catch to furnace; A⁴, stay and catch to furnace when cover is raised; A⁵, holes for introducing soldering irons; B, inner casing to furnace carrying hearth; B¹, lugs for lifting out inner casing; B², brackets supporting hearth; C, hearth or grate; D, ash pan; D¹, guard to ash pan worked by spring lever; D², spring lever raising ash pan guard; E E, draught holes; E¹, cleaning hole; F F, casing to ash pan; G G, standards to support furnace. The action of the improved furnace is as follows:—The fire is lighted upon the hearth C, the draught being between the inner and outer casing, and also between the bars of the grate. The cover is raised, and fixes itself at the angle shown by the dotted lines; the melting pot is introduced, and the soldering irons laid in the hollows A⁵. By slightly depressing the handle, the stay catch A⁴ releases itself, and the cover falls into its place. To clean out ash pan, press down guard lever with one hand, and rake out ashes with the other.

PRESTON CHURCH, SUSSEX.

Sir,—While on a ramble along the south coast, I heard that the little parish church of Preston, near Brighton, was undergoing restoration. As it is one of the churches I had before visited with pleasure, I went to see what was being done. I found that the chancel was not to be restored, and so beneath the chancel arch was placed a rough partition to inclose it, while the nave is undergoing a "thorough restoration" under a Brighton architect. The roof was completely taken off, and a new one substituted. Well, all this may be right, but, as you probably know, this church contains some very interesting wall paintings—"S. Michael Weighing Souls," "S. Margaret," "A Scene from S. Thomas à Becket's Life," &c., on the east wall of nave, and several remains of figures in the jambs of the windows of nave. The whole of these were exposed to the weather (and it was raining when I visited the church), and against one of them was placed a ladder. I asked whether they ought not to be protected, and was told in reply that they were so painted that weather could not hurt them, that as regarded the one against which the ladder was placed, it had been operated upon by a workman for three hours, and he could make nothing more of it than I saw then (that was not much, certainly). Now, what I should like to ask you is this:—Was my informant right in saying old wall paintings, such as these, are proof against bad weather? And, as regards this particular instance, are not these paintings too valuable to be at the mercy of the British workman, exposed without any sort of protection? Apologising for troubling you.—I am, &c.,

W. R.

PROPOSED ASYLUM, S. ANN'S HEATH COMPETITION.

Sir,—In the interests of architectural competition I send you the enclosed correspondence for publication. I would only add one remark, that it is curious that two of the most uncompromising Classic architects should have been called in to advise on Gothic designs, and that Mr. Edmund Sharpe, than whom no one is better qualified as a judge of Gothic, should have had his report ignored in order that Mr. Holloway's private opinion might derive a colourable support from professional authority.—I have the honour to be, sir, your obedient servant,

E. W. Godwin.

July 18, 1872.

Sir,—In accordance with your request that we should examine the thirteen designs for the asylum which you are about to erect at S. Ann's Heath, in order to advise you as to those most entitled to the two first premiums which you have offered to the competitors, and as to those entitled to the sum of £50 each, we beg to report as follows:—

Thirteen designs have been submitted, bearing the mottos stated below, and arranged in alphabetical order:—1. Alpha, 2. Au bon joueur vient la balle, 3. Choose the best, please the rest, 4. Con Amore, 5. Economy, 6. Humilitas, 7. Improbus labor omnia vincit, 8. Mens, 9. Mens sana in corpore sano, 10. Progress, 11. Quadrant, 12. Sanitas, 13. Vivere aut vincere.

We have carefully examined the drawings and the descriptions having reference to the suggestions issued by you, and to the requirements of such an institution. We have also had tables prepared showing the numbers and sizes of the principal rooms and the amount of accommodation provided in those designs which seemed indisputably to be the most promising, together with the cubical contents of the several buildings.

You were also so good as to call in the advice of Dr. Yellowlees and Dr. Lockhart Robertson, well known for their experience as able medical superintendents of asylums. We must state that although there is considerable merit and taste displayed in the several projects, and evidence of a great amount of time and care having been bestowed upon the preparations of the drawings, yet there is not one of the designs which would not require more or less modification of plan and general arrangement ere it could be carried into execution for practical working. Consequently we have selected that one as first which with the least alterations and no sacrifice of its own individual character, would, we believe, be the most suited to your purpose and the least costly.

We beg, therefore, to state our opinion that the first prize should be awarded to "Alpha," the second to "Improbus labor omnia vincit," and that the following should, in the terms of your offer, receive £50 each:—"Au bon joueur," &c., "Con amore," "Economy," "Mens," "Mens sana," &c., "Progress," "Quadrant," "Vivere aut vincere."

We cannot forbear to notice the series of drawings bearing the motto "Quadrant"—a very original and artistic design, displaying a novelty of conception in the plan and much picturesqueness in the elevations, but with practical deficiencies and defects which prevented our placing it first or second.—We beg to remain, sir, yours faithfully,

(Signed) THOS. L. DONALDSON.
THOS. HENRY WYATT.

Thomas Holloway, Esq.

533, Oxford-street, London, W.C.,
July 19, 1872.

DEAR SIR,—I beg to inform you that having taken the best professional medical advice I could in order to arrive at the selection of the best design for the asylum I propose to erect at S. Ann's Heath, I have to enclose you a copy of the report made to me by Messrs. Donaldson & Wyatt, by which you will learn that they suggest that I should award the first premium to the motto "Alpha," by Messrs. Crossland, Salmon, & Jones, and the second to the design marked "Improbus labor omnia vincit," by Mr. Alfred Smith, and that your design is entitled to a premium of £50, which I will remit you on Monday next.

If you and other gentlemen, whose designs are premiated, desire that they should be exhibited, I will endeavour to secure a gallery at 9, Conduit-street, for that purpose.

Thanking you for the great amount of time and care you have bestowed in the preparation of your meritorious drawings—I remain, dear sir, yours faithfully,

THOMAS HOLLOWAY.

E. W. Godwin, Esq.

533, Oxford-street, W.C., July 22, 1872.

DEAR SIR,—As recommended in the award made by Messrs. Donaldson & Wyatt, I have the pleasure to enclose you a cheque for £50, for which please send receipt.—I am, dear sir, yours faithfully,

THOMAS HOLLOWAY.

E. W. Godwin, Esq.

July 23, 1872.

DEAR SIR,—I have to acknowledge the receipt of your note enclosing cheque for £50.

In the report you were kind enough to send me I find two designs of mine are awarded premiums—one with the motto or word "Mens," the other with the motto or word "Quadrant."

As you have not specified which design the cheque is intended for, I append a receipt for the one which stands first in the report, marked "Mens."

Lest it should have escaped you, I shall mention that I have not received a cheque for the other design marked "Quadrant."—I remain, dear sir, yours faithfully, (Signed) E. W. GODWIN.

Thos. Holloway, Esq.

533, Oxford-street, London, W.C.,
July 24, 1872.

DEAR SIR,—I am in receipt of your favour of the 23rd inst. acknowledging a cheque I sent you for £50 as a premium for your design under the motto of "Quadrant."

On the 15th of June, or thereabouts, you sent with your design marked "Quadrant" an envelope in your handwriting with your name and address, but no mention is made that you had sent a second design marked "Mens," nor have I until now known from whom the said design emanated, although I caused an advertisement to appear in the *Builder* of last Saturday, the 13th inst., requesting that the architect who had sent in this design would be pleased to communicate his name and address to me, but no notice has been taken of the advertisement, and it is only now, when I send you £50 for the design marked "Quadrant," that you inform me that the design marked "Mens" was yours.

I cannot understand why you did not, when communicating to me on the 15th ult., say that you had also sent in a second design marked "Mens." Had you have done so, I should have informed you that I could not receive more than one drawing from you that would be eligible for a premium, as it would, in my opinion, have been acting unfairly to the other gentlemen who entered into the same competition with you, according to the terms of my printed suggestions, consequently I cannot see at present any valid reason why I should premiate your second design marked "Mens."—I am, dear sir, yours faithfully,

E. W. Godwin, Esq. THOMAS HOLLOWAY.

29, Craven-street, Strand, July 27, 1872.

DEAR SIR,—I had to leave town just before the designs were sent in for the above, and the omission of the envelope containing my name was altogether an oversight of my clerk's. In common with many other architects, I hardly ever read the *Builder*, and thus an advertisement might easily escape notice.

The object of a competition under motto is to preserve secret the architect's name, and to give to merit in design, and that alone, the premiums proposed. There was nothing in your instructions to limit any architect as to the number of designs he might send in, nor did you propose to give premiums in any other way than as prizes for the best design. Had my design marked "Mens" been by another architect, he would, according to your own showing, have received your premium. I fail to see what the authorship has to do with it. In the Bristol Assize Courts competition, under motto, Mr. Waterhouse decided that the premiums should be given to the designs marked "1066," "Colston," "Nisi Prius." They were all three designed by me, but the Town Council did not hesitate to give me the premiums.

Until, therefore, I see other grounds than those named in your letter, I shall expect the premium of £50 which your professional referees have awarded to my design.—Yours faithfully,

(Signed) E. W. GODWIN

Thos. Holloway, Esq.

August 5, 1872.

DEAR SIR,—I beg to call your attention to my letter of the 27th ult., and shall be obliged by your cheque for £50, which I consider due to me according to the terms and report issued by you.—Yours faithfully, E. W. GODWIN (per W. A. G.).

Thos. Holloway, Esq., 533, Oxford-street.

533, Oxford-street, London, W.C.,
August 17, 1872.

DEAR SIR,—If you will refer to a paragraph on the 17th page of the printed suggestions for a proposed lunatic asylum, of which you have a copy, you will find the following:—

"The competition for the building will be open to not more than fifteen selected architects, and he whose designs shall be considered by Mr. Holloway to be the best will receive a premium of £200. The second best design will receive a premium of £100, and eight of the next best designs will each receive £50."

As thirteen designs were sent here, I concluded that they emanated from as many architects, and it was not until I received your letter of the 23rd July, acknowledging receipt of my cheque, that I learned that you had sent in two designs, and that only twelve architects had competed—eight, of course, being entitled to £50 each.

I have paid the premiums of £200, £100, and seven others of £50 each, and I am prepared to pay to one of the three gentlemen—viz., Mr. J. Norton, Mr. Welby Pugin, or Messrs. Hine & Sons—the eighth premium of £50.

Messrs. Donaldson & Wyatt's report of the 18th ult. could go no further than to advise or recommend, their powers being so limited. I wrote to you on the 19th July, recognising your plan under the motto of "Quadrant." You have received a premium for that design, and I cannot recognise in any way your second design of "Mens."

You very properly sent with your design marked "Quadrant" your name and address as being the author, but not until you had received my letter of the 22nd July, with a cheque enclosed for £50, did you inform me that "Mens" emanated from you. Had you acquainted me, as you should have done, that you had sent in a second design, I should at once have returned it, as I could not, in fairness to others competing, allow more than one design to be sent from any one person.

You state that on one occasion Mr. Waterhouse awarded you two prizes for two designs. He was in that instance, I presume, fully empowered to do so, but Messrs. Wyatt & Donaldson had no such power, and perhaps the competition was without limit as to numbers; but be this as it may, I consider the right of decision remains with me, and me alone, and that I am not bound to recognise your second plan.—I am, dear sir, yours faithfully, THOMAS HOLLOWAY.

E. W. Godwin, Esq.

29, Craven-street, Strand, Sept. 25, 1872.

DEAR SIR,—Mr. Godwin, notwithstanding what you have written him, entertains hopes that you will yet see the fairness of his claim to the premium for his second design, and send him a cheque. He has been informed by all he has mentioned the matter to that it would be a most unusual proceeding on your part to refuse to premiate both his designs, "Mens" and "Quadrant." Will you kindly let him know, therefore, whether you intend adhering to your former decision?—Yours truly,

WM. A. GODWIN (for E. W. Godwin).

Thos. Holloway, Esq., 533, Oxford-street.

533, Oxford-street, Sept 26, 1872.

DEAR SIR,—I am in receipt of your two letters of the 24th and 25th inst., and in reply to the former, I have to say that if you send here at any time your design "Mens" will be delivered. It came here a second time from some photograph establishment. Had I been here at the time I should have directed it to be sent to you.

Now, as regards what you say in your second letter, I have only to reply that if you desire to try the question of right with me, Mr. Bowen May, of 67, Russell-square, my solicitor, will accept service. I have said on former occasions all that I thought was necessary' and I don't see any more can be advanced on the subject.

I assure you I should be considerably pained should your demand have to be settled by a court of law.—Yours truly, THOMAS HOLLOWAY.

E. W. Godwin, Esq.

29, Craven-street, Strand, Sept. 28, 1872.

SIR,—In reply to yours of the 26th inst., I beg to say that for the information and in the interest of the profession at large, Mr. Godwin shortly purposes publishing the correspondence consequent upon your refusal to premiate both his designs.—I am, sir, yours obediently,

WM. A. GODWIN (for E. W. Godwin).

Thos. Holloway, Esq.

533, Oxford-street, Sept. 30, 1872.

SIR,—Your letter of the 28th inst. acquaints me that you intend to publish the correspondence which has passed between us, to which I see no objection.—I am, sir, your obedient servant,

E. W. Godwin, Esq. THOMAS HOLLOWAY.

Intercommunication.

QUESTIONS.

[2668.]—**Measuring the Height of Chimney Stacks, &c.**—Is there any simple method of ascertaining the height of chimney stacks or spires, &c., without an instrument? I shall be happy to see an answer in the affirmative, and the rule.—VALUER.

[2669.]—**Circle upon Circle.**—I am sadly disappointed, as well as many others of the readers of the BUILDING NEWS, that the question (2649, p. 191) put by "E. L. S." on the circle upon circle has elicited but one answer—that by "H. C.," which I don't deem satisfactory. In Vol. XXI., No. 872 (Sept. 22, 1871), p. 221, there is a report made of a visit made to the Bradford Mechanics' Institute, where there were seen masons at work on models of skew bridge, circle on circle, &c.; joiners at staircases, handrails, roofs, domes, &c. I should think if application were made to them they would probably furnish an answer to the problem.—J. E.

[2670.]—**Warborough Church, Berks.**—The tower of this church is a seventeenth century one, built partly with old stonework, &c., at the west end of a nave of Decorated period. The west wall of the nave is of the older date, and hidden behind a gallery are a fine tower archway, and above it a small doorway. From the ringers' floor this doorway communicates with the church. Its inner arch to the tower is, I should think, of the date of the tower; but the doorway itself, with shafts in the jambs, and a segment head very nicely moulded, is evidently of Decorated character. I have met with a similar thing elsewhere. Now, can any of your readers tell me what it was intended for? I don't think it could have led to the upper side of groining, for there is no evidence of the church having ever been groined; and since it is below the roof collar, it cannot have been to pass along the upper part of roof. Any information that will throw light on its use will greatly oblige.—W. R.

[2671.]—**Party Walls.**—Would any correspondent inform me, through "Intercommunication," if a person is allowed to build a house against mine, making use of side wall to plaster on? Also, if allowed to carry up a brick on edge against same? My idea is he ought to build a party wall sufficient to stand if mine was ever to be taken away.—A SUBSCRIBER.

REPLIES.

[2656.]—**Puzzolana.**—Do I understand from "J. T. J.'s" reply that bricks, tiles, and chips of pottery, when ground to a very fine powder, form a hydraulic cement without any other admixture?—M.

[2660.]—**Cement and Mortar.**—I am much obliged for Mr. Gilbert R. Redgrave's interesting and extremely practical reply to my query. I would mention that in the case of the failure of the cement paving alluded to, the bottom under the paving was very dry when the cement was laid down, and has been ever since, and is now also perfectly dry, but the peculiar nature of this failure is that the work has come up in an immense sort of bubble after having been apparently sound and unmoved for eighteen months after having been laid. Since writing my last I have been informed by a bricklayer that he has noticed that in a brick on edge in cement coping to a wall where there are occasional rounded ramps, the bricks will lift at the ramps and become loose there after having been apparently sound for twelve months. With regard to the skinning of the top surface, I intended this not to mean the shelling off of the top coat, but the separation of a film from the top of the top coat, which it appears to me must have been caused by wetting and floating too much in the finishing with a steel float, by which means the cement was brought to the surface, and there formed a brittle and at the same time porous skin. I have endeavoured to form cement paving as an artificial stone, so that it might wear all through its thickness alike, by laying it in one coat of material all through the same—viz., cement and washed sand—but the result is not at all satisfactory.—R. L.

Our Office Table.

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A Musical Local Board.—The Wallasey Local Board appears to have for one of its members a candidate for a lunatic asylum. At a recent meeting this gentleman, objecting to the manner in which a motion of his had been received by the Board, entered the room with a parcel, untied it, and exposed to view a large pair of shining brass cymbals, which he deliberately fastened to his hands, and threatened to give the Board some music if they did not entertain his motion, at the same time stating that they (the Board) were interfering with the rights of a member. The chairman attempted to go on with the proceedings, when the member raised his cymbals and commenced a variety of performances. The chairman called the musical member to order, but he again sounded his cymbals, and declared that if there were 1000 men before him with bayonets he should not be put down. He eventually succumbed to one policeman.

Working Men's Home.—In the current number of *Fors Clavigera* Mr. Ruskin states that he has been asked to contribute to the purchase of a park near the metropolis, and he replies "I will not; and beg you, my working readers, to understand, once for all, that I wish your homes to be comfortable and refined; and that I will resist to the utmost of my power all schemes founded on the vile modern notion that you are to be crowded in kennels till you are nearly dead, that other people may make money by your work, and then taken out in squads by tramway and railway, to be revived and refined by science and art. Your first business is to make your homes healthy and delightful; then, keep your wives and children there, and let your return to them be your daily 'holy day.'"

Technical Education in France.—There has just been founded at Rouen, under the patronage of the Chamber of Commerce, the Société d'Emulation, and the Rouen Lloyd's, an "Upper School of Industry," organised on the widest basis, and specially intended for the instruction of persons who are to be placed at the head of manufacturing establishments, &c. The school was opened on Monday last, the 7th inst., and will not only give that general education necessary for the management of any industrial work, but also the special instruction required, in all the chief departments of national industry, such as spinning, weaving, dyeing, the chemical arts, machine making, &c. The teachers who have been selected are men who unite to extensive theoretical knowledge an extensive acquaintance with practical work. Workshops, laboratories, and collections of specimens of various objects have been fitted up with great care, and efforts will be made to maintain them on a level wish the progress of discovery and invention, so that the students may be provided with all that is necessary for the successful prosecution of their studies. "The Upper School of Industry" is to be connected with the "Upper Commercial School," and will be placed under the same administration. It is expected that it will receive support from all those persons who interest themselves in commercial and industrial education.

Arbitration in the Iron Trade.—The North of England Arbitration Board held a meeting on Tuesday at Darlington, Mr. Rupert Kettle being arbitrator, to decide what class of workmen should be entitled to the late advance of 20 per cent., and also to obtain, if possible, a uniform scale of wages for the same class of work. In the case of the shinglers at Monkwearmouth, it was decided that the dispute must be left to mutual arrangement. With regard to the men entitled to the advance, Mr. Kettle decided that only those who were permanently employed could be entitled to it, as many men were classed as iron workers in the North that were not in Staffordshire or Wales. Speaking generally, Mr. Kettle thought that men who had subscribed to the Board of Arbitration would be entitled to the advance, except in special cases. The proceedings of the Board were very harmonious.

German Fresco Paintings.—The *Cologne Gazette* says that a very interesting discovery has just been made at Fribourg. In removing the whitewash from the walls of the old post-office of that town, some fresco paintings have been discovered, which seem to be the production of Holbein or of his school. The building was formerly known as the Baster Hof, or Court of Bâle, and Holbein was a native of that town. Unfortunately, the paintings have suffered serious damage.

The Chelsea Vestry and the Metropolitan Railway Company.—At the last meeting of the Chelsea Vestry, Mr. Birch called attention to the terms of the contract between the Vestry and the Metropolitan District Railway Company, by which the Company bound themselves to restore all streets, houses, &c., disturbed by them six months after the 11th July, 1864. Mr. Birch commented on the unsightly hoarding which is now at the north-west corner of Sloane-square, in front of a quantity of waste land. A memorial was read from various inhabitants of Sloane-square, complaining of this hoarding and waste land, which caused a serious drawback to their business. The vestry resolved to instruct their solicitors to take the necessary action to get the terms of the Company's contract carried out.

Durability of Oak.—At the annual meeting of the London and Middlesex Archæological Society, held last week at West Drayton, those who assembled explored the site of old Drayton House, where the Pagets—now Earls of Exbridge and Marquises of Anglesey—kept great state for two centuries after the Reformation down to the demolition of their mansion and the sale of the property to another family a little after the middle of the last century. The party next drove across to Harmondsworth, where the church and the magnificent barn of the adjoining farm formed the principal attractions. The barn is one of the finest in the kingdom, it is nearly 200ft. long by about 40ft. broad and 40ft. high, and the original oak timbers with which it was built nearly 500 years ago, together with its beams and even the oaken pins by which it is fastened together, are still perfectly sound.

The Institution of Civil Engineers.—The list of members of this society now contains the names of 16 honorary members, 754 members, 1,122 associates, and 243 students, making a total of 2,135 of all classes. During the last three months the deaths have been recorded of Messrs. Nathaniel Beardmore and Joseph Walter Gale, members, and of Messrs. Edward Banfield, Charles Haslett, Thomas Howard, Robert Johnson, and William Sykes, associates. In the period referred to, no addition has been made to the list, as the meetings have been suspended during the vacation.

Society of Engineers.—The first meeting of the Society for the session 1872-3, was held on Monday evening last, the chair being occupied by the President, Mr. Jabez Church. A paper was read by Mr. E. G. Bartholomew on "Telegraphic Batteries." The author commenced by referring to the two papers he had previously read before the Society on the subjects of "Telegraphic Conductors," and "Telegraphic Instruments," observing that the present paper on batteries would render the subject complete. He compared the electric telegraph to the steam-engine—the conductor represented the steam-pipe, the instrument the engine, and the battery the boiler. The author then went on to describe the different kinds of batteries, the principles of their construction, and to explain the laws by which the force generated is governed. Pointing out that the force generated was proportionate to the chemical action, and to the consumption of some of the elements of the battery, he showed the necessity for preventing any such action or decomposition from proceeding, unless the resulting force was utilised. The author further showed how, by rendering the surface of the most oxidisable metal homogeneous, local action was suppressed. The various methods of joining up the elements, whether as forming one large plate, or in series, was alluded to, and the resulting character of the force explained.

The Draining of the Zuyder Zee.—The *Vaderland* of the Hague announces that the project of drying the Zuyder Zee (the space between Wieringden and Medemblick, of about 50,000 acres) is again under discussion. The example of the Lake of Haarlem is there to show that, nothwithstanding the immense difficulties of the task, the ground gained from the sea by the hand of man and devoted to agriculture, largely remunerates the expense of the acquisition. Is is known also that the Zuyder Zee was not always the immense gulf it now is, but was once a thick forest, bathed by a river, which, after traversing several small inland lakes, threw itself into the sea near the Texel. About five centuries back the waters of the ocean, rushing in by the mouth of the stream, reached these ponds, and, causing them to overflow, produced a general inundation.

Tearing up the Streets.—Remonstrances against the practice of constantly tearing up the streets have hitherto been so useless that those who complained before complain no more. It is only a fortnight since we (*The Metropolitan*) drew attention to the fact that Leadenhall-street has been "up" three times since the beginning of the year, and on Monday it was stated, at a sitting of the City Commissioners of Sewers, that the thoroughfare was being again disturbed. The engineer said the Commissioners were powerless to prevent these disturbances, because the Gas and Water Companies possessed authority, by Act of Parliament, to take up the streets when they thought fit. If this be so, the sooner the attention of Parliament be called to the subject the better. Meanwhile, we may suggest that some police restriction should be placed on those companies which have the privilege of rooting up the pavements whenever it suits them. They ought surely to be made liable to the law of obstruction as well as other people.

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CHIPS.

A new Church School was opened at Monks Eleigh on the 27th ult. It is in the Elizabethan style, and will accommodate 140 children. Mr. Hawkins is the builder.

The foundation stone of a new Wesleyan Chapel was laid on Tuesday week, at Nuneaton. The cost will be £1,400. Mr. C. Box, of Stretton-under-Tosse, is the builder.

The well-known Rosherville Gardens and Hotel were sold on Tuesday, the hotel for £4,500, and the gardens for £24,600.

The interesting little Early English church of Cowley, near Cheltenham, was reopened on the 22nd ult. by the Bishop of Gloucester, after a complete restoration under the direction of Mr. Albert Hartshorne.

On the 27th ult., the Bishop of Oxford reopened Frieth chapel, in the parish of Hambledon, Bucks, after the addition of a south aisle, at a cost of £450. Mr. H. Woodyer was the architect.

At a meeting of the Town Council of Winchester, held on the 3rd inst., Mr. John James Lancefield was unanimously elected city surveyor. There were 35 applicants for the appointment.

Mr. Henry James Lancefield was on the 4th inst. appointed Clerk of Works, at the New Guildhall, Police-station, Museum, &c., now in the course of erection in Winchester, from the designs of Messrs. Jeffery & Skiller, of Hastings, the contractors being Messrs. Joseph Bull & Sons, of Southampton.

A new iron railway bridge across the Allan has been constructed by the Caledonian Railway Company. It is a solid and neat structure, supported in the centre by a stone pier.

A great bridge has just been completed by the Fivès-Lille Company, spanning the Nile at Cairo. Its total length is 1,353ft., and its width 38ft. It is composed of girders resting upon stone piers, and the centre span swivels to allow vessels to pass through.

The new City of London Library and Museum, Guildhall, which has been erected from a design by Mr. Horace Jones, F.R.I.B.A., the City Architect, will be formally opened about the end of next month by a *conversazione*.

In the recent repair of South Leigh Church, near Oxford, after taking off many coats of whitewash, some wall paintings of the fifteenth century appeared. They are in distemper, though faded, and are capable of recovery; the oldest are "The Resurrection," and "The Weighing of Souls."

A new church, capable of holding about 250 persons, was opened at Perranporth, in the parish of Perranzabuloe, Cornwall, on the 1st inst. The architect was Mr. E. M. Perry, and the cost about £800.

Mr. John Hart, builder, the largest owner of property in Leamington, committed suicide by hanging himself in his house on Tuesday morning. The act is believed to have been committed through overtaxed brainwork.

The dome of the Vienna Exhibition building for next year will be the largest yet constructed. It will be 275ft. high and 353 in diameter, and in the latter measurement it will be about treble the size of the dome of S. Paul's, more than twice the size of S. Peter's, and very nearly double that of the London Exhibition of 1862.

Upon excavating for a foundation for the new Post Office, in S. Martin's-le-Grand, a quantity of old ware was dug up, and is now at the South Kensington Museum.

The Lambeth Vestry recently sent a few of its members as a deputation to the Metropolitan Board of Works, and received, shortly afterwards, a bill amounting to £3 2s. 4d. for refreshments. The journey from the Lambeth Vestry Hall, in Kennington-road, to Spring Gardens (a distance of about two miles) must be very exhausting.

A "Model Houses Association" is talked of. It is to be "purely philanthropic" in principle, and the promoters propose to effect their object by pulling down the London rookeries and putting up better dwelling places on the sites. Many similar proposals have failed, and if this one is to succeed the "purely philanthropic" element must be eliminated.

The Church of S. Peter, Cornhill, is undergoing extensive reparation and improvement (including repewing), and will be reopened early in December.

Trade News.

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WAGES MOVEMENT.

London.—The adjourned meeting of the carpenters and joiners' "Uniformity of Time and Wages Delegation" was held on Saturday last. The chairman said that since the last meeting the strikes at Messrs. Gillow's,' Oxford-street, and Corbett & M'Clymont's, Brompton, had been arranged on terms satisfactory to the committee, and there were only a few isolated cases now to be dealt with. With respect to Corbett & M'Clymont's firm, it was only intended to take on about 15 of the carpenters at present, and this would leave about 40 men still to be provided for during the coming week. He would, therefore, suggest that one more levy of 6d. be made, to be paid on Saturday evening next. He thought Corbett & M'Clymont's men were men worthy of all praise, for the manly way in which they had acted.—Mr. Isaac moved "that a levy of 6d. be paid on next Saturday evening." He thought this would be the last required in the present movement. The motion was unanimously adopted.—The secretary read a letter from the secretary to the masters, stating that his committee clearly understood that by the agreement only half an hour was to be allowed for dinner-time upon outdoor jobs during the winter months. He asked for the instructions of the delegates upon the point.—It was moved that the secretary write to the Masters' Committee stating that the deputation left the interview with the full impression that the dinner-time was to be one hour all the year round, and that, therefore, the half-hour dinner-time could not be accepted. The motion was agreed to.—Mr. Matkin, in reply to a question, said the balance-sheet containing the full accounts was in the hands of the printers, and would be ready in a few days. The total sum received by the Strike Committee had been over £7,000, and the balance left in hand, he hoped, would be sufficient to pay the cost of printing the balance-sheet. All other liabilities had been discharged. He hoped the levy of 6d., as the last, would be paid up well and punctually next Saturday. Some discussion ensued as to the future conduct of the movement, which several delegates contended should not be closed until they had obtained the "nine hours and ninepence" unconditionally, while others advocated the appointment of a "Watch Committee," who should have the power to convene a general meeting of delegates if thought necessary. Ultimately, however, it was decided that as the delegates must meet again on Saturday evening next, the question as to future operations should be then decided upon.

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TENDERS.

Brixton.—For the erection of five houses in the Lowdon-road, Brixton, for H. W. Nevill, Esq. Messrs. Habershon & Pite, architects, Bloomsbury-square:—

Temple & Forster	£2374
Woodward	2350
Adamson & Sons	2349
High	2330
Ritson	2297
Cheesman	2245
Tongue	2117
Hiscock	2115
Morgan	2100
Haynes	1739

Brixton.—For the erection of four shops at Brixton for H. W. Nevill, Esq. Messrs. William T. Habershon & Pite, architects, Bloomsbury-square:—

Adamson & Son	£3190
Woodward	3150
High	3070
Temple & Foster	3024
Ritson	3025
Chessum	3010
Morgan	2995
Hiscock	2815
Haynes	2738
Tongue	2559

Canterbury.—For additions to Elmstone Court, near Canterbury, Kent, for Mr. W. J. G. Barrett. Mr. Richard Martin, architect:—

Bridgman, Nuthall, & West	£2178
Wilson & Son	2290
Jarrett (accepted)	2187

Croydon.—For the erection of the Oval-road School, Croydon —

Nightingale	£3969	0	0
Taylor & Sons	3656	9	0
Walkley	3665	0	0
Allen	3040	19	1
Heade	3196	0	0
Wright Brothers	3157	0	0
Waterson & Co. (accepted)	3045	0	0
Spearing*	2969	0	0
Peskett & Taylor*	2961	0	0
Coles*	2940	0	0
Crooke & Wall*	2878	16	0

* Withdrawn.

Cuddington.—For erecting stabling for Mr. A. Hector, Worcester House, Cuddington, Surrey. Messrs. John Giles & Gough, architects. Quantities by Mr. Goode:—

Jocelyne (accepted)	£871

Enfield.—For the erection of lodge and farm buildings at the Ridgeway Oaks, Enfield, for F. S. Foley, Esq. Mr. Thomas J. Hill, architect:—

Field & Sons	£758
L. & W. D. Patman	647
Bayes & Rammage	590
Ward	565
Childs	531

Essex.—For additions and repairs to Stacie's Farm House, Manningtree, Essex. Quantities by Mr. Ormes:—

Canham	£488	0	0
Saunders & Son	467	0	0
Capon	463	10	0

Greenwich.—For offices for the Phœnix Gas Company at their works at Greenwich. Messrs. Church & Rickwood, architects. Quantities supplied:—

Jerrard	£979
Shuttleworth	914
Colls & Sons	897
Johnson	880
Garland	850
Tongue	830
Kirk (accepted)	744

Herts.—For the erection of new farm buildings at Shenley, Herts, for W. Edwards, Esq. Mr. A. King, architect:—

Cordell	£490
Adams & Co.	470
Cook & Groom	464
Boyce	408

London.—For alterations, &c., at the "Rutland Arms," Rutland-street, Hampstead-road, for Mr. Richard Miles, Mr. Charles Bradley, architect:—

Cairns	£179
Durrans	175
Berridge (accepted)	175

London.—For boundary enclosure to S. Stephen's Church, North Bow. Messrs. Tolley & Dale, architects:—

Scrivener & White	£456
Perry & Co.	447
W. & D. Brown	436
Browne & Robinson (accepted)	373

London.—For the erection of the "Turnpike House" public-house at Stamford-hill. Mr. R. Button, jun., architect. Quantities by Mr. W. H. Barber:—

Emery	£2250
Lewis	1931
Child	1890
Rist & Brown	1827
Marr	1752
Linsell	1747
Jarvis	1687

Mortlake.—For certain repairs to the Bootmakers' Asylum, Mortlake. No quantities:—

Fish	£225	0	0
Pashley	209	10	0
Hart	179	0	0
Pride	165	0	0
Bowling	135	0	0
Aries (accepted)	130	0	0

Portsmouth.—For the erection of the Public Elementary School in New-road, Buckland, for the Borough of Portsmouth School Board. Mr. Thos. Hellyer, architect:—

Evans Brothers	£3850	0	0
Burbidge	3500	0	0
Light Brothers	3459	0	0
Quick	3439	0	0
Ward	3397	0	0
Barnes & Moody	3200	0	0
Eades Brothers	3195	0	0
Morey (accepted)	3165	0	0
Smith	3150	17	0

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Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

COMPETITIONS OPEN.

Chester, October 31.—For plans for the alteration and improvement of S. Paul's Church, Boughton. The architect whose plan is most approved will be employed as the architect of the works, on the usual conditions, and a premium of £20 will be given for the second best.—Rev. H. Falloon, S. Paul's Parsonage, Chester.

The Royal Northern Agricultural Society (Dwellings for Agricultural Labourers), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Admiralty (Whitehall), October 15.—For supplying Her Majesty's Dockyards with ironmongers' sundries.—Mr. F. W. Rowsell, Superintendent of Contracts.

Admiralty (Whitehall), October 16.—For the supply of ironmongery and tinware for warrant officers' mess.—F. W. Rowsell, Superintendent of Contracts.

Admiralty, October 16.—For the erection of a coast-guard station at South Kessock, Inverness.—Director of Works Department, Admiralty, Spring-gardens-terrace, S.W.

Admiralty, October 17.—For the supply of iron nails to Her Majesty's dock and victualling yards.—Mr. F. W. Rowsell, Superintendent of Contracts.

Admiralty (Whitehall), October 18.—For the supply of wire to Her Majesty's Dockyards.—Mr. F. W. Rowsell, Superintendent of Contracts.

Billericay Highway Board, October 21.—For the erection of a bridge over the Washway, near the farm of Mr. Merrington, Momtnessing.—Mr. C. C. Lewis, Jun., Clerk, Brentwood.

Birkenhead Improvement Commissioners, October 16.—For re-constructing and diverting part of Grange-vale Outfall Sewer.—Mr. Ambrose Udler, Clerk to the Commissioners, Birkenhead.

Birstal Local Board (Gasworks), October 10.—For the purchase of gas-tar and ammoniacal liquor.—Mr. J. Smith, Clerk to the Local Board, Gas Office, Birstal.

Board of Works (Holborn District), Oct. 21.—For the construction of 960ft. of half-brick sewer and other works in Great Saffron-hill.—S. W. Hopwood, Clerk to the Board, 47, Chancery-lane, W.C.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

Bradford School Board, October 18.—For the erection of Dudley Hill School.—Messrs. Knowles & Wilcock, Architects, 9, Leeds-road, Bradford.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works. Victoria, British Columbia.

Exeter.—For additions to the Victoria Hall.—Mr. J. Chudleigh, jun., architect, Newton Abbott.

Gaslight and Coke Company, October 31.—For the purchase of the coke manufactured at Beckton, from January 1 to September 30, 1873.—Mr. J. O. Phillips, Secretary, Horseferry-road, Westminster.

Great Western Railway, October 17.—For the supply of Quebec yellow pine.—Mr. F. G. Saunders, Paddington Station, W.

Metropolitan Board of Works, October 17.—For the supply of materials, and the execution of day and measured works to the main drainage sewers, pumping-stations, &c.—Mr. J. Pollard, Clerk to the Board, Spring-gardens, S.W.

Midland Railway, October 15.—For the erection of a passenger station at Nuneaton.—Engineer's Office, Midland Railway, Derby.

Oude and Rohilkund Railway, October 23.—1.—For the supply of ironwork for the superstructure of a bridge over the River Goomtee, at Juanpore. 2.—For the supply of the ironwork for superstructure of a bridge over the River Sail, at Juanpore.—Mr. C. C. Johnston, Managing Director, 110, Cannon-st., E.C.

Priestwich, Oct. 17.—For altering the corridor at the workhouse, Crumpsall.—Mark Ogden, Clerk to the Guardians, Union Offices, York-street, Cheetham.

Ramsgate, Oct. 21.—For the supply of 50 gully gratings, frames, and weirs, for the Local Board.—E. Ellice-Clark, Assistant Surveyor to the Board, Town Hall Ramsgate.

S. Helen's, October 17.—For the erection of proposed new Town Hall and police buildings in Cotham-street.—Messrs. Culshaw & Sumners, Architects, Rumford-court, Liverpool.

Sheffield, Oct. 16.—For the erection of a district police station in London-road, Highfield.—John Yeomans, Town Clerk, Sheffield.

THE BUILDING NEWS.

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LONDON, FRIDAY, OCTOBER 18, 1872.

THE DAWN OF THOUGHT IN CHURCH DESIGN.

IT is a remark of M. Viollet le Duc that no fashion lasts for ever—not even an absurd one. A change is sure to happen sooner or later ; and the belief is encouraging when we apply it to the many fashions of our time, which can scarcely change for the worse. One such fashion—that which for thirty years or more has tyrannised over all that pertains to church design—does seem to be making preparations for departure. The papers read at the recent Church Congress—the expressed opinions of some eminent ecclesiologists, lay as well as professional—the occasional utterances of such journals as the *Saturday Review* and the *Athenæum*, and the criticisms of such independent Mediævalists as the portrayer of the "Church Architect" in last week's Building News, all point the same way. Church designers are growing tired of being treated like children, and church founders are growing tired of childish work. One generation has lived and died in leading-strings, and that, it may be hoped, will suffice. One race of architects has tried the experiment of suppressing their reason, and acting as if their souls were not their own ; the results are patent to the world, and every one may see whether the success was worth the sacrifice.

The fashion of the last thirty years may be briefly described as this : to make old churches look like new ones, and new churches like old ones. When it was a question of building, for a modern congregation in a modern town, a place for worship according to the reformed ritual, then the works of the Middle Ages were contemplated with fear and trembling. It was not reverence merely, nor the intelligent admiration which it becomes us to feel for those whose feats, perhaps, no one now living will equal; it was a blind indiscriminating submission which did as little honour to its receivers as its givers. It put all precedents on a level ; the greatest master-mason of the thirteenth century was an infallible authority ; but so was the smallest village carpenter, and the former, could he have returned to earth with the ordinary passions of humanity, might have had more kicks than thanks to bestow on some who called themselves his disciples. If anything could have saved them, it would certainly be his inextinguishable laughter, not so much at the badness of their work as at the pedantry and lifelessness of it. Bad work—in the sense of its being coarse, imperfect, and uncouth—was common in the pre-Gothic era, and not rare in any ; but then it had one redeeming quality. It was the work of men who, with such brains and such training as they had, were really doing their best. They relied on themselves, and made the most of their faculties ; they met their difficulties fairly, and whether they conquered or were beaten, at any rate, they fought them like men. The departing generation of church architects did exactly the opposite. To suppress all reason, all invention, all free force of every kind, was apparently their one persistent effort. To master any difficulty which had not already been mastered for them they seem to have held little less than a deadly sin. The whole history of art has hardly, perhaps, such another contrast as that between the Mediæval church-builders—daring, versatile, inventive, full of life and freshness and originality—and their abject copyists, who spent their lives in renouncing all those self-reliant qualities which made their exemplars what they were. Servility, however, is not reverence, and while the one may accompany the most thorough freedom of thought and action, the other does not shrink from desecrating what it professes to adore. The thirteenth and fourteenth century builders, though it would have been pardonable for *them* to think lightly of their predecessors, yet treated their productions with respect. If they removed an earlier work to replace it with something incomparably more precious, how often have they left us, and left us untouched, by way of memorial, some interesting relic of the pre-existing structure. Their self-styled successors, on the contrary, seemed determined to leave nothing undefiled, and though too timid to use their own judgment in their own buildings, they acted as if caution were needless when it was only the treasures of old English art that were concerned. Lifeless design and reckless "restoration" have been, on the whole, the special characteristics of the departing race of church-architects, and, though what they have produced will vanish, what they have effaced will never return.

"There is a soul of goodness in things evil," and it would be hard if all this mischief had not produced some incidental benefits. By the vivisection of our churches and minsters, some knowledge of their anatomy and some public interest in Gothic architecture have become generally diffused. So far, this generation is in a better position than the last one for using the Gothic style in the only way in which that or any other style is worth using—namely, for making it bend itself to all our requirements, and for altering it, cautiously and slowly, but unhesitatingly in any points, if any there be, in which it refuses to yield. It is possible that in church architecture the need for the modification of style may be small. It is possible, on the other hand, that if church arrangement is really and thoroughly to be adapted to an Anglican service and to large congregations, considerable changes in detail may be desirable. Such a church arrangement, involving, as it does, the removal of obstructions to sight and hearing, is likely to lead to wide roofs and wide arches ; and, as a matter of fact, wide spaces have hitherto been found to harmonise best with domed rather than with vaulted or wooden-roofed interiors. Problems of this kind, however, will solve themselves as time goes on—or rather will be solved, not by the speculations or even the experiments of individuals—but by the general judgment of the community. The great thing at present is to have it admitted that "we also are men," that the architects of the present day have just as much right to use their own intelligence as had those of six hundred years ago ; and that there is just as much hope before them in doing it. This is, in fact, the *only* hope of a genuine and living art, or of an artistic reputation which will outlast the hour. Those that follow must go behind ; and the architect who thinks to equal the Mediæval builders by persistently copying their works is as wise as the painter who should think to equal Raphael by persistently copying his pictures. What has been done once as well as human power can do it, does not need to be done again : and, in art at least, it *cannot* be done again equally well in the same way. So much the more reason to have spared our old buildings ; so much the more reason to have struck out fresh thoughts in our new ones. Every builder who cares for his work may well say, as did Mr. Beresford Hope last week, that he is constantly growing more conservative with regard to the first, and more progressive with regard to the second. If all the conditions of society, if all men's habits and beliefs had lasted without the shadow of a change from the time of Edward I. till now, our best chance of an architectural revival would still lie in the introduction of fresh ideas for architecture to assimilate. The flame of that enthusiasm which forms the motive power of all great things cannot feed on the ashes of the past, and the hardest thing to set on fire is that which has already burnt itself out. If, in this sense, one thing ever burnt itself out more unmistakeably than another, it was certainly the Mediæval type of church arrangement ; and yet people are still standing round its embers and expecting it to burst into as great a blaze as before. There was such a splendid illumination there yesterday that they think of all places that is the most likely for another one to-morrow, and they do not realise that the only way of producing such another is to put fresh fuel on the sparks that remain.

The new, or comparatively new, ideas which, in the last few years, have been introduced by well-known church designers, are not very numerous, nor, for the most part, very striking. When Mr. Street, and latterly Mr. Brooks and some others, have narrowed their side aisles from 10ft. or 12ft. to 6ft. or 8ft., this moderate and by no means unprecedented change has been denounced in some quarters as an unpardonable innovation, and lauded to the skies in others as a masterpiece of original thought. Both the censure and the praise seem unaccountably strong for an alteration which would have been natural and obvious enough even if the Dominicans and others had not left us examples of it ages ago. It certainly gives increased convenience, though perhaps at some cost in proportion, and in both internal and external picturesqueness ; but on the whole its merits seem to outweigh its defects. The wide nave, which has frequently accompanied the narrow aisle plan, has lately made a striking appearance in Mr. Hansom's Church, the Gésu, at Manchester. It is here between 40ft. and 50ft. across, lofty in proportion, and vaulted in terra-cotta. The chief artistic difficulty is the apparent shortness produced by so great a width ; and the question again suggests itself whether the best treatment of a nearly square area is not that of the dome rather than the vault : of the central lantern rather than of the length-requiring avenue. The church which Mr. Seddon has in progress at Yarmouth, and which, according to the published descriptions, will only have four columns in an area seating 1,300 persons, is an experiment likely to be watched with much interest. Mr. Blomfield's new work in Oxford-street is so exceptional in its purpose that its author might hesitate to put it forward as a contribution to the general science of church building ; but it shows that if unusual forms of plan are desirable on the score of convenience, Gothic art is quite capable of dealing with the resulting construction. After all, it is only the dawn of thought in church design that we may venture to look for yet. Those who set about the introduction of new ideas into a territory where they are so much needed, are likely at first to have no easy time of it. An architect has not only to see his own way clearly in the matter, but to make his clients see it also, and the latter half of the process is often the more difficult of the two. It is, however, only a question of time ; for even absurd fashions ultimately expire, and then even reasonable ones get the chance of coming to life.

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FOUNDATIONS.—IV.

PILING (CONCLUDED).

THE great variation in the results of formulæ for calculating the weight that a pile will safely carry seems to be due to the different manner in which investigators regard the effect produced by a ram descending from a height by the force of gravity, in comparison with the dead weight that the pile will carry when driven to a given distance by a blow of a given force. Experimenters on the strength of materials that can be subjected to such strains as are within our power to exert on small specimens have arrived at tolerably equal results in most cases ; but the case is very different when we try to ascertain the power of the ground to hold piles so tightly as to bear given weights by its pressure against given areas of their sides. For this reason it is desirable, as every engineer says, that those who are engaged in pile-driving, whether they be resident engineers, contractors, inspectors of works, or foremen, should particularly note down every action, such as the number of blows actually given to each pile, the penetration or set at each blow, or in any given small number of blows, the weight of the ram and the height of its fall, the interval of time between two blows, the nature of the ground, and, indeed, every other circumstance affecting the work done. An investigator into the laws of pile-bearing will then be able, by taking a great number of such notes, to deduce from them formulæ by which the bearing power of piles in other cases, and under circumstances stated, may be calculated. The following is an instance of such observations. The foundations of the abutments of a bridge are laid upon piles pitched 3ft. apart lengthwise and crosswise, from centre to centre of the piles. They are of Baltic fir, from 11in. to 13in. square, and average 12in. square. They are 22ft. long, and are driven 20ft. into silty clay, with occasional thin layers of sand. The weight of the ram was 15cwt., and the fall 12ft. The observations made on the driving of the whole number of piles show that, on the average, the first blow with the 12ft. fall drove down the pile 8in.; the tenth blow, 4in.; each blow being given in an average time of 35 secs. These 10 blows drove down the pile 5ft., being an average penetration of 6in. each blow. The next 5ft. of driving required 23 blows, the last of which effected a penetration of 2in. The time occupied was 12 min.; average penetration per blow 3in. The third 5ft. required 40 blows of the ram, the last of which caused a penetration or set of 1in. The time was 23 min.; the average penetration per blow $1\frac{1}{2}$in. The last 5ft. required 82 blows, which were given in 45 minutes, and caused an average set of $\frac{3}{4}$in., the last blow giving a set of $\frac{1}{4}$in. A final blow being given, and the movement showing no increase, the pile was considered sufficiently driven. It was intended that the maximum load on each pile should be 20 tons. A few of the piles were subjected to actual trial by loading each one with 60 tons of iron, and no movement was perceptible. The specified minimum set of $\frac{1}{4}$in. with a ram weighing 15 cwt. and falling 12ft., was in some of the piles attained, while there remained several feet of the head of the pile out of the ground. In these cases two test blows instead of one were given, and on the refusal of the pile to be driven beyond the limit in either case the driving was discontinued rather than run the risk of shaking and damaging the timber, for in these cases it was probable that the point of the pile had met with some partial aggregation of hard material, and to continue hammering the pile-head was to expend the force in bruising the timber.

After the heads of the piles had been cut to a uniform level, the ground was excavated to a depth of 2ft. below them, and the spaces filled in with concrete; sills, 12in. × 9in. were notched down upon the heads of the piles, crosswise of the abutment, and upon the sills sleepers 12in. by 9in. were laid over the lines of piles lengthwise of the abutment; the whole area of the foundation was thus bound together, and any unequal pressure on parts of it would be almost necessarily transferred to the whole area. There is an actual pressure on this foundation of two tons per square foot, or about 18 tons on each pile, if we consider the piles individually, but if we grant that the whole number are sufficiently tied together by the sills and sleepers so as to act as one, then by taking the outside piles as carrying a load equal to that of those inside, the average weight on each is reduced to 15 tons. These abutments are of brickwork, which was begun upon the concrete at the level of the pile heads, thus the spaces between the sills are filled up with brickwork in this case; but it is to be remarked that the spaces are often filled up with concrete, and that the whole area is sometimes planked over and the brickwork begun upon that. In each of these abutments there is a mass of brickwork of about 6,000 cubic feet interposed between the concussive force of a passing load and the foundation piles, which materially lessens the effect upon them of the impactive force of a live load, but this is a different sort of case from one in which the intermediate structure of a bridge, between its load and its foundation, is of rigid materials and not massive. When the intermediate structure consists of piles of timber or iron the concussion of a passing load is much more directly transmitted to the foundation. When it is ascertained by any formula what load a pile will carry, whether or not its weight and the measure of its elasticity be taken into account, its actual load should not exceed one-third of that ultimate load where a large mass of material intervenes between it and the pile; and when the load is conveyed directly upon the pile, perhaps one-tenth is as much as would be safe. Major Sanders, of the United States' Engineers, has given in the Journal of the Franklin Institute a rule which takes no account of the weight of the pile or its elasticity, its length or its sectional area, and which, therefore, seems to be a rule which leaves important elements out of consideration. It is this:—"The pile will safely bear, without danger of further subsidence, as many times the weight of the ram as the distance which the pile is sunk the last blow is contained in the distance which the ram falls in making that blow, divided by eight," provided the pile moves equally at several of the last blows. To apply this to the case above-mentioned, in which the weight of the ram is 15 cwt., the fall 12ft., and the last set $\frac{1}{4}$in., the ratio between the fall and the set is as 576 to 1,

$$\text{and } \frac{576 \times 15}{8} = 1080 \text{ cwt.} = 54 \text{ tons.}$$

The same rule is formulated in Molesworth's "Pocket-book" thus:—

Let D = the set of the pile by the last blow, in inches.
Let H = height the ram has fallen, in inches.
Let L = safe load for the pile in cwts.

$$\text{Then } L = \frac{W\,H}{8\,D} \text{ approximately.}$$

He adds that W, the weight of the ram, is 4 cwt. in ordinary pile engines, which we can hardly understand, and attribute it to an error of the printer. Taking W, however, to represent what we believe to be the ordinary weight of the ram of a crab pile engine—viz., from 10 to 20 cwt., and in the case now under notice actually 15 cwt., the formula may be applied thus:—

$$D = \tfrac{1}{4}\text{in.}$$
$$H = 12\text{ft.} = 144\text{in.}$$
$$W = 15 \text{ cwt.}$$
$$\text{Then } L = \frac{W\,H}{8\,D} = \frac{15 \times 144}{8 \times \frac{1}{4}} = 1080 \text{ cwt.} = 54$$

tons as before.

Professor Rankine, in his "Manual of Civil Engineering," says that for piles standing in soft ground by friction (as in this case) it appears from practical examples that the limit of the safe load is about 200lb. per square inch of area of head. This would be about 13 tons on one of these piles. But in an elaborate formula which he gives for the ultimate or greatest possible load, in which not only the conditions above stated are taken into account, but the sectional area of the pile, its length, and the modulus of its elasticity, that ultimate load would be, according to this formula, about 220 tons, so that the 54 tons derived from the formula of Major Sanders and Mr. Molesworth as a safe load is about one-fourth of the greatest possible load; the 18 tons previously mentioned as the possible actual load on one pile in these foundations is one-twelfth; the more probable actual load of 15 tons is one-fifteenth; and the 13 tons derived from Mr. Rankine's statement of 200lb. per square inch of head is one-seventeenth of the greatest possible load according to his own formula.

It does not appear that any of these authorities have taken into consideration the manner in which the piles are to be driven in respect of speed; but that must surely influence the result very much, for if a pile be run down so rapidly that the vibrations are communicated to the ground in contact with it at the moment of giving the last blow, a certain penetration or set of (say) $\frac{1}{4}$in., due to that blow, would indicate a greater bearing power in the pile than the same set if the blow were given to the pile after the ground around it had had time to come to rest. In the former case we might expect a small set, such as $\frac{1}{4}$in., to indicate that if, after it had been given, the pile were to be left untouched for a minute or so, and another blow then given of the same intensity as that which drove it the last quarter of an inch, it would be immovable.

Errata.—In the last article on this subject, towards the bottom of the last column, for "8ft." read "8," and for "same" read "ram."

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SCULPTURE AT THE PRINCE CONSORT MEMORIAL IN HYDE PARK.—II.

IN the colossal groups at the four extreme angles of the Memorial, the sculptors were unfettered by conditions unfavourable to their art. In the four smaller groups projecting from the clustered granite columns of the architectural structure, the imposed conditions were sufficiently trying to break the heart of a trained sculptor. In outline, straggling disposition of parts and position, the four smaller groups are pictorial, not sculptural, conceptions. They have also a quasi-architectural value. The motive of the designer was that there should be in each group a symmetrical disposition of four figures in a semi-pyramidal form, ascending towards the columns and central statue, like the weather-line of a buttress. This treatment destroyed all freedom of composition. The next condition, that the figures should be detached from each other, made breadth of mass impossible. The height above the eye at which the groups are placed has produced awkward foreshortenings of recumbent figures, whereby continuity of line is entirely sacrificed. Not one of the essential features of a group was possible, while its primary feature was entirely omitted. A detached group must have a central object. That central object is its point of dignity in conception; it should be one of the principal lights in its *chiar' oscuro*; the point whereon the harmony of its lines and balance of parts depend; the focus of its beauty and impressiveness. These groups have no such object; their centre is an empty space! Nor can that central object be removed, as here attempted, by placing an important or taller figure on one side of the composition. Art will not be tricked in that way; nor by any possibility can the eye be led away by it. Such compositions as these, if admissible in sculpture, are only artistic in the form of relievos. A view of any of them taken at random would be pleasing and harmonious in relief upon a flat ground. Selected views would work out admirably as relievos. Their pictorial treatment renders the necessity for a flat background more imperative. But they have neither background, isolation, nor contrast in their surroundings. One clashes with the other.

Mr. W. Calder Marshall, R.A., is the sculptor of the group of "Agriculture." It consists of a central draped female figure of no distinctive type, before whom a characterless semi-nude male figure kneels. The male figure holds a plough, and has accessory chemical and engineering implements. On the right hand of the group is a pretty Greek boy, kneeling, with a lamb in his arms. A sheep, beautifully carved, is reclining near him. On the left is a draped female figure, seated, with a sickle and a sheaf of corn. Such are the materials wherewith Mr. Marshall essays to symbolise "Agriculture." The principal figure is draped without consideration for underlying symmetry or beauty of outline. The head of the other female figure is that of a Scotch lassie. The whole conception is common-place, tame, and without interest. The conditions appear to have exercised a dispiriting effect upon the sculptor, from whom might have been expected a charming idyllic work, recalling the breezy uplands, the lowing herds, the sunshine of the spring, the ripening summer sky, the joy, the cheer, of hay and harvest homes, the strength that tills, and the gladness that secures the ripe fruits of the tillage. Full eyes and cheery lips, strong arms and gentle limbs, the zephyr's raiment and the unclad form, were part and parcel of the subject. Unfortunately, the imaginative power and refined sentiment which have hitherto graced the works of Mr. Marshall are not to be found in this. His ideal figures are lovely; his statue of Crompton, in the market-place at Bolton, is one of the most graceful and skilful portrait works in the kingdom. He has, however, not been happy in this group of "Agriculture," for the simple reason that he was trammelled by unhappy conditions.

The group representing "Manufactures" is by Mr. H. Weekes, R.A. In style it is not attractive. It is conceived in the imitative spirit of Greek art peculiar to this country during the later period of the Georgian era. A draped female figure with her right hand upon a bee-hive and an hourglass in her left hand, stands looking towards a reclining draped female figure, who is presenting to her a piece of woven fabric. On the left-hand side stands a male, semi-nude figure, of the Greek Hercules type, in pantaloons. His accessories denote that he symbolises the most potent of all branches of manufacturing industry — engineering. In front is a reclining draped youth, with accessories pertaining to the potter's art. An insipidity of character prevails in the nude portions of this group, while the draperies display more than ordinary free treatment and spirit. Perhaps all that could be accomplished has been done in composition. A buttress-like sweep of outline makes the work conform to its architectural intention. The figures join each other with a degree of compactness which is cleverly managed. The draperies, deeply incised, lead to the heads of the principal figures. So far, there is partial grouping. But Mr. Weekes, with his masterly power of composition, fails to produce a true group or an elevating and interesting subject. The four figures look at each other across a void. They speak—they gesticulate; but their speaking is to no purpose; their occupation is neither heroic nor beautiful. Only in a very tame manner do they symbolise the mighty strength and delicate subtlety of mental and manual power, which raise the factories of this age into one of the greatest marvels of the world.

In the group of "Commerce," Mr. T. Thorneycroft has, to a great extent, assimilated the feeling of his work to that of the Memorial, while retaining the grace and delicacy of pure style. It is rather effeminate in character, but exceedingly chaste and elevated. The composition is pictorial to a fault. The figures are isolated, and have little more in common with each other than the ground upon which they are placed. A principal female figure, in Classic costume, holds in her left hand a cornucopia, and with her right extended hand touches the shoulder of an ambitious youth, who stands in a dignified attitude looking over the world and into the future. This draped youth is a fine conception. His costume is of the Early Italian period, and he may be regarded as typically representing the first dawn of Commerce in the palmy days of Italy. In his right hand he holds a book and a purse; in his left a pair of scales. A bale of goods, over which he stands, completes his meaning. By a variety of skilful arrangements, all worthy of being noted, he becomes the leading object of the composition. In the first place he looks out of, not into, the empty space between himself and the other figures. Secondly, he is made a little taller than the secondary figures in the other compositions, and, being brought nearer to the centre, acquires the importance of a central object. But this clever management does not make a group. The isolation and prominence given to the youth only increase his importance as a single statue. The other figures—two of them, at least—might be removed without injury to the work. Again, it is apparent that Art will not be tricked. No amount of cleverness in grouping can make amends for the absence of cardinal principles. The other figures are a Merchant in Oriental costume, sitting upon a chest, and holding a casket; and a youth seated upon the ground with a handful of corn and a bag. The artistic value of these is only in their contrast to the vigour of the erect youth. They add nothing to the story which the youth tells so admirably; they supply the required complement of four figures. Taken altogether, this is a promising work. It possesses the germs of a style of pure sculpture, which may be developed into harmony with the severe types of prevailing Gothic Architecture. It is a good beginning, and a fair indication of what our future art of sculpture may be, with the infusion of a more masculine spirit.

The group of "Engineering" is the production of Mr. John Lawlor. The drawing of this work is charming. The clean carving, bringing out the crispness and transparency of the marble, is sweetly delicate. The conception is not equal to the execution. A tall female figure in Greek drapery places her right hand upon a book, and extends her left by way of encouragement to a man and youth in recumbent positions before her. The man is a draped typical figure, holding a bevel cogwheel. The youth is also typical and draped; he has a pair of compasses in his hand and a roll of drawings spread upon the ground. On the right side of the group sits a realistic "navvie," a literal modelling of "the man, in all his habit as he lived." The principal allegorical figure and the navvie look across the central space towards the boy with the drawings. The typical figure with the wheel also looks towards the centre. The absence of any purpose in the combination of personages is striking. The confusion of ideas which they present belongs to an obsolete period of sculpture more remarkable for conceits and pretty fancies than poetic intelligence. The head of the female figure is very sweet. The heads of the typical figures are beautifully modelled, but their striking national character is not consistent with ideal beauty. As a composition it has no sculptural merit; it is purely pictorial.
J. C.

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Discovery in Rome.—A remarkable statue has been discovered near Aspra, in the country of the Sabines, not far from Rome, by a labourer who was digging the ground. It is in white marble, and had apparently occupied a niche in some building, the remains of which were found around it. It is life-size, and represents a Venus naked to the waist, but draped from there to the feet. The whole right arm and the forepart of the left are wanting. Several other portions had been injured and restored formerly, and probably for that reason the statue had been placed in a niche and transformed from a Venus to a Naiad, for which purpose pipes had been introduced into the body, and a basin, some fragments of which have been found, placed in the hands. This work, which belongs to the highest period of art, bears a striking resemblance to the celebrated Venus of Arles, in the Paris Museum. The work just found, which is supposed to belong to the school of Praxiteles, has been transported to Rocca-Antica, where it is preserved with the greatest care in a room of the Marquis Vincentini's palace.

THE COMPLETION OF S. PAUL'S.

(From an elaborate article in the last number of the "Quarterly Review.")

A FEW months ago there was some discussion in the newspapers about a reported scheme of iconographic decoration at S. Paul's. The announcement of this scheme was startling. People began to consider when Wren lived, and what his "sacred" purpose might have been respecting "iconography." The Committee had not mentioned it in their "Appeal," nor is it discoverable in the "Parentalia," and it was soon found that the thing was, in connection with S. Paul's, entirely new; that Wren knew nothing of it, and, therefore, that it could not come within the estimate of £250,000 for the "completion" of his work. We subsequently heard that the "scheme" had not been quite adopted, but that the "architect" who proposed it had been appointed to act with Mr. Penrose because he is said to "possess" what is called the "ecclesiastical element," which "element" Mr. Penrose was not known to "possess." Neither, however, we fear, did Wren possess it. Rather it *possessed* him, and it pursues him still. This ecclesiastical element it was that, as Dean Milman told us, spoiled the plan of the cathedral, and by its clerical intervention caused those crippled and distorted forms and outlines which have made the interior a subject for apology instead of praise. And now we have this element of evil omen manifest again, prompt, ignorant, and conceited, and prepared to add defacing insult to its former injury.

The "architect" in question is one of those sketching draughtsmen who, by some cleverness with their pencil and bow-pen, obtain a notoriety among the half-taught people who take drawing to be architecture, and who, because their reading and observation have digressed into some remote regions of ecclesiasticism and professional technicalities that are not often explored by sensible men, are accepted as authorities on ecclesiastical "properties" and iconographic or other furniture decoration. They generally affect the Ritualist party in the Church, and their weak designs and trumpery church furniture and furbelows have gained a temporary popularity among the clergy that tends to mental degradation and religious coarseness. Their success is principally due to the entire want of workman culture. Weak-minded people can take easily to connoisseurship, and of course prefer to patronise some dapper draughtsman rather than risk their superfine gentility by giving personal and sympathetic aid or counsel to a true "artist" working-man.

The gentleman who is to scheme the saintly decoration for S. Paul's refers us to his work at Worcester College Chapel, of which a reverend member of the College committee has written a careful description. He says, in a letter to the *Guardian*, that

> "Mr. Burges has covered walls, architraves, tympana, roof, niches, floor, with exquisite designs, every one with a significant meaning. He found a 'room' and he has left a 'chapel' full of thought, of genius well applied, of symbolism most effective. It is a perfect study from end to end. It is the only building in England where the walls were designed for the windows, and the windows for the walls. There is no floor like it in England of elaborate mosaics. The massive seats of dark walnut inlaid with box, simply unrivalled. The stall ends each an artistic study in zoology or ornithology. I cannot think of a detail that has not been most carefully thought over in the studio, and artistically elaborated in the chapel itself. I venture to say that on this side the Alps there is no sacred building of the kind that so impresses one as a building designed as a whole, and in its minutest detail, for the glory of God and for the pious and religious uses for which it was intended as Worcester College Chapel. Mr. Burges may with pride and with confidence refer to his success there as the proof that he can handle an Italian building in the spirit of the style *without the introduction of a single Gothic detail.*"

We ventured lately to declare that in the decoration of their churches the clergy are habitually and very greatly subject to imposture. An illustration of this fact would have appeared personal and invidious, so we allowed the statement to appear in naked verity. Providence, however, has been kind, and here we have all the illustration that could be desired. The walls, &c., are indeed "covered" with paint of many colours laid on in several kinds of pattern; but the colours have no harmony, and the patterns no significance. They are there evidently by accident, and because the "architect" did not know what else to do. There is endless elaboration, but not the slightest beauty, and the whole is an affair of ill-assorted shreds and patches that might belong to a dozen different buildings, and which have no true combination either of colour or of form. The distinction that the reverend critic finds between a "chapel" and a "room" strikes us as strange. It serves to show that consecration is an affair of gilding, oil-colour, and varnish, and that not the dedication but the tattooing of a man reveals the saint. In Jacob's sleeping-place our reverend friend would evidently not have recognised the House of God, and to him the Gate of Heaven could not be manifest were it not properly painted.

On the ceiling of "Worcester" Chapel are some small paintings which, supposing worshippers used looking-glass reflectors, might be found "full of thought;" but the queer figures that peer down from the lunettes below the ceiling are evidently portraits of Jew haberdashers selling ribands at a fair. The *cinque-cento* patterns on the walls, and the misuse of colour, show singular ineptitude and ignorance. Below the windows is a long processional display of saints and angels, kings, archbishops, monks, and devotees. This we find illustrates the "Te Deum;" yet saints so terribly malformed and destitute of sense could hardly be esteemed a "glorious company," and then the angels are so ill-set upon their legs that there becomes an obvious necessity for wings. These figures are just twenty inches high, and distant twenty feet from the ordinary point of view; here, however, they become invisible, for the windows, filled with coarsely drawn and coloured pictures, overcome entirely the small figures painted just below.

On the dark wainscoting against the wall there are little panels some two feet apart, each enclosing three odd Roman letters, which, we may explain for future visitors, are dislocated fragments of the hymn "Te Deum laudamus." The stall-ends also have as "ornaments" the emblems of the Passion of Our Lord. This may be called religiousness in Art, but most reasonable men will say that to make the "Hymn of Praise" and the said emblems of the Passion mere tricky ornaments for students' chapel benches is abominably profane. Were these things expressed as lightly and familiarly in words by laymen there would be a painful sense of scandal and impiety. Here, then, the "symbolism most effective" is in full display, and this we are assured is "Christian Art." Will clerics and their draughtsmen never understand that such free handling of solemn things tends to irreverence, and makes the observing man think sadly and with lessening respect of those whose want of wisdom causes such offence? Besides, there is no kind of artistic value in the work. No doubt it is "laborious," as such work must be, and yet is quite mechanical, and was certainly inlaid and put together in a workshop, and not, as our critic has it, "in the chapel itself." The mosaic floor is sprinkled with some scripture names, and its light colour and the heavy ceiling are in contrast like a thundercloud above a chalk-made turnpike road. Round about the altar on the floor we find a counterfeit presentment of the "Sower and the Seed," each being duly labelled. And all this childish nonsense we are told "impresses one," and it was thus designed for the "glory of God," and that Mr. Burges may "with pride refer to it." Strange doctrine for a clergyman. We should have thought that deep humility would best accord with reference to a work so piously designed.

The chapel is a very simple building, a fit place for the religious services, devout or otherwise, of a few dozen students in whose domestic and collegiate surrounding we may assume that luxury and ostentation are not habitual. The "Quad" is sober, picturesque, and plain. The chapel door is opened and reveals a perfect contrast. Here is no

> . . . quiet calm retreat
> For humble prayer and meditation sweet;

but an expensive bauble, an obtrusive job of decorator's work—dismal and gaudy, and most inartistic in conception and detail a complete contrast to the unconscious dignity that, whether simple or sumptuous, should be the ruling characteristic of a college chapel. This work is Mr. Burges's pattern card, the sample of his capability in the *cinque-cento* style, and a more wretched exhibition has not been submitted to the public.

The church at Cork that Mr. Burges has lately built is also quoted, and, judging from a photograph of the west front, the "taste and talent" of the architect are all inside the building. The front is poor, and much beneath mere common place, the upper and the lower halves are totally at fault in scale. No true artist would have made so palpable a blunder. Again, if we examine the sketches made by Mr. Burges for the proposed new room at Harrow School, we find that the "design" is scarcely worth the name. Trade Gothic details and a heavy wall, with no combining fancy, are said to be a Gothic building in the shape "of a Greek theatre;" and, with similar discrimination, may be called a Grecian building made with Gothic details. By way of critical approval we are told that the architect will use the garden slope for the gradation of the seats. Such power of adaptation may, among these gentlemen, be worthy of remark; and possibly the slope may further serve to give sufficient current for the drains. The interior is fussy and draughtsmanlike, with the most abject poverty of fancy and invention. To screen this the decorator's workman is turned in to do his worst, and he, at any rate, succeeds. The Grecian-Gothic figure-drawing rivals the work at "Worcester." We commend these sketches to the subscribers and committee of S. Paul's, and they can then imagine how "complete" the church will look when covered "ecclesiastically" after such a fashion, and when the walls become "Christianised;" exhibiting, as in a decorator's show-room, rows of "saints" and groups of "martyrs" duly labelled.

Such is the style of work that at the present day attracts the connoisseurs, tickles the clergy, and makes the public stare. Its influence is altogether bad, and so reacts even upon the draughtsmen. For instance, All Saints' Church, in Margaret-street, shows much able clerkmanship, but its natural sequence is the tawdry panelling at "Winchester" Chapel and the mechanically copied merry-andrew choir painting at S. Cross. We are told that this painting is a "restoration." Clearly, then, it is not "art;" and to deface a noble building with such rubbish is the very insolence of bad taste. The latest result is the front of Keble College, where the "All Saints" fiddle-faddle has been perfectly developed, and the enfeebling influence of draughtsman's work is made thoroughly manifest. Work such as this might be the plaything of a child, or the light, half-considered relaxation of the working builder, but that any "architect" should be able to sit down and patiently "design" such imbecilities is a sad revelation. The association of this work with that at Balliol in common censure has been criticised. Still, it was true, and yet there is a difference between these works that should be noticed. The one is worse than former buildings by the same "architect," the other work is only just as bad as its poor predecessors. At Manchester the clap-trap Law Courts "composition" might at a ladies' boarding-school, have gained a prize "for prettiness," and the coarse common-place at "Balliol" is no worse. In character and antecedents the two buildings differ, but in value and position they have reached a pitiful equality.

With such obvious deficiencies in Mr. Burges and his work, there is some interest in the question how it came to pass that he was appointed to prepare a scheme for the complete defacement of S. Paul's. The true explanation seems to be that, owing to the general ignorance and disregard of building-work, the Cathedral has again fallen into the clutches of the "Connoisseurs." One of Mr. Burges's sponsors, however, is an "architect of eminence," who has already "decorated" and "completed" another church of Wren's; and thus his taste and judgment can be seen—when the gas is lighted—in the interior of S. Michael's Church, Cornhill. This "architect's" experiment on Wren's work may be, therefore, taken as a specimen of "that thoroughly religious, grave, and solemn character" which he presumes to say S. Paul's "so much needs;" and so we recommend our readers to pay his "ecclesiastical" kaleidoscope a short visit, when they will find that Wren's windows are blocked up with "wheels" and other "stock" office patterns, so that half the light is excluded, and the remainder is, by coarse stained glass, almost entirely obscured, and the church is thus sunk down to the most childish notion of sensationalism. Here, then, we see how, as this "architect" assures us, "the true and thorough ecclesiastical element gives the decorative arts that subordination to their architectural position which is essential to their true use, but which was so entirely neglected in buildings of the period of S. Paul's." What in the name of common sense is this "ecclesiastical element"? Has it anything to do with the "spiritualists" and Mr. Home, for they love darkness? Was Wren quite a fool? Did he make S. Paul's such a dark den that candles were essential at mid-day, a place for bats, or a cathedral for the blind? or so gild and paint the place with tawdry colours that light itself should be unwelcome? Nothing gives a more painful sense of the blank ignorance of the public in affairs of art than the emission of such "grave and solemn" nonsense. People might be induced to think that this "ecclesiastical element" had an architectural existence, or that it had, at any rate, some "element" of meaning. The fact is, however, that it is a mere trade imposture, a windy sounding phrase just such as Bottom might have used. It has no meaning, and is best illustrated by the dull stupid darkness at S. Michael's Church. The public, then, have had, it would seem, more than enough of "architects" and their opinions. These gentlemen are very well in their way as names for committees to quote, farmers of clerks, men of business, and generally traders who supply "art notions" to the clergy and the more ignorant of the laity; but they are not architecturally "artists," and nothing is more discouraging in the present prospects of S. Paul's than its ominous surrounding of architectural drawing-masters, the "ecclesiastical element," and connoisseurs.

And now, with great relief, we turn to men of sense accustomed to broad daylight; and to these we say, that what we now have written is entirely free from the possibility of personal or party feeling or spirit of sectionalism in Church affairs. We write by way of warning; and when this is done, the evil must be strongly indicated and described without reserve.

The great desiderata at S. Paul's appear to be: first, that the church should be completed as its architect designed; and that in doing this, the sacred use and dedication of the church shall become manifest. We have already stated all that is known of Wren's "intentions," but we did not draw particular attention to the sound and sensible way that he proposed to get the work done well. "For this purpose"—the dome mosaic work—"he had projected to have procured from Italy four of the most eminent artists in that profession." This is the key of the whole matter. Observe, here is nothing about schemes, or architects, or draughtsmen, or of the work being "national." Wren wanted "artists," which in his time meant not painters and drawing-masters, but cultivated and imaginative workmen. He does not ask for one man who would scheme or design the patterns, but for four men—a precise number—*who would do the work.* This is the true art method. But all the shows of art that we possess at Kensington and its affiliated schools, or at academies or institutes, are very much delusions.

In architecture, owing to the great supply of illustrated works, and the habitual want of original and independent workmen's thought, the means of knowledge far surpass the power of analysis in either the "professional" or the public mind. "Knowingness" has, in fact, become a special curse. Architects are, like certain paralytics, always on the watch for some new manifestation that they may at once secure to be a help for their too manifest decrepitude. Every "new thing" in detail is promptly seized and made available in any practicable way, and then the public are called to admire the great "knowledge" of the "architect," and how he has "authority for every detail." In the same way connoisseurs are wonderfully well informed about old buildings, but they have no clear discernment of the merits of new men. They wear their eyes in the back of their heads, and are consequently valueless as leaders of the public taste.

Art is often styled the handmaid of religion. The phrase has much unction and a touch of patronage, which, were it not entirely untrue, Art might be thankful for. Art is no handmaid, but a queen in her own right and by the grace of God, and Science and Religion are her sisters. Art and her sisters duly sympathise in their concern for human nature, but, though mutually helpful, they are entirely independent in their spheres and modes of operation. This should be clearly understood, and the distinction between mere conjunctive association and co-operative action should be carefully remembered. Religion purifies the heart of man. Art gives expression and development to the imagination, and Knowledge feeds and nourishes the mind. These processes are not common to the active powers, but only to the subject—Man; and their results are directly reflex. Art does not diverge into the domain of religion, nor does religion, unless tainted with presumption, trench on science. Each should retain its individuality if it would maintain its power. When, therefore, we are told that Art has an "ecclesiastical element," we fail to discover what the words can mean. The impression made is one of pure absurdity, and leads to scepticism. Are we to expect, further, the announcement that the Newtonian theory has an "element" of apostolical succession; that the path of religious duty can be found in the ecliptic; or that an artistic action is involved in sacramental influence and operation? Art, then, knows nothing of "ecclesiastical elements," and has no communion with them; and where they are intruded in the place of Art, the result is art negation, feebleness, and imbecility. Art is not in any possible way "ecclesiastical," but entirely and simply human; and is to be influenced for good or evil only through men's minds, and not at all by doctrines, creeds, or formularies of the Church. Ecclesiasticism has, in all ages, been either the obstacle or the ruin of Art. In Egypt the fine, varied fancy of imaginative work was limited in its scope, and oppressed almost to destruction by the priestly order. The Greeks, more than any other nation, set Art free from sacerdotal influence. Their gods and goddesses were the noblest ideals of the human form, and so they best illustrated divine thought and power as then conceived; but they were not "religious" or "ecclesiastical." The Athenians of Pericles and Phidias had not become "too superstitious," but had strong belief in human nature, and expressed it well. Religiousness may poetically be imputed to artistic work, just as it often is to objects in nature; but this imputation is an evidence that in actual fact religion is not there.

(*To be concluded.*)

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OPENING MEETING OF THE NEW ARCHITECTURAL ASSOCIATION OF IRELAND.

THE opening meeting of the above Association took place in Dublin on Thursday evening, the 3rd inst., under most favourable circumstances. The chair was filled by the first President of the Association, J. J. O'Callaghan, Esq., F.R.I.A.I. There was a very large attendance of members and of gentlemen invited to take part in the inaugural proceedings.

Mr. J. H. Longfield read the report of the committee.

The President then delivered an elaborate inaugural address, from which we take the following passages:—

The preparation for the profession is one of our weakest points, and in this respect France and other continental countries have the greatest advantage over us. It is necessary that a good general and scientific education, and a fair knowledge of drawing, should be learned at school; this should include a general knowledge of perspective, its principles and practice, and good training in freehand drawing. When you have entered on your duties as pupils you will find you are in the right way to become artists not only in name, but also in reality; and you will more readily work your way up in the office, and will the sooner be entrusted with responsibility. Then a knowledge of construction and the uses of materials should be your next care; this will give you a great confidence in your office work, because you shall then understand what you are doing, and there will be no hesitation in any constructional matter.

You should lose no opportunity of acquiring a thorough knowledge of all the trades; this is absolutely necessary for the making of your working drawings. When some new ideas are well and clearly laid before workmen, you find it difficult to get them to realise them, it being too much their habit to endeavour to do things their own way. How can you then possibly expect they should understand them if they are imperfectly sent from your office, much less hope they will follow you with confidence or respect? Without this knowledge your client will not have that confidence in you which is necessary, while the builder, who is really anxious to have the benefit of your assistance, and to follow your plans, so often finds that in matters under his own province you are at fault, that your influence is weakened. Were the educational defect removed, this state of things could not exist, and the aid of the architect would more generally be sought. The public would know their interests were safe in your hands; they would feel that technical knowledge and artistic taste were employed in their behalf. and they would unreservedly place themselves in your hands, and the cause of art and the public would be served in the end. The necessity for this is very apparent in our own country, where the position of an architect is very little understood, and good architecture, I fear, very little appreciated.

The pupil should early learn to sketch, and sketch well. Sketching is a power in the hands of an architect. It is impossible for you to be able readily to put together your ideas unless you sketch well; it gives you the greatest facility in grouping your buildings, and even planning them. You have the means of storing up in your minds every good idea, detail, and group. This power of sketching, combined with a thorough knowledge of perspective, is of the greatest benefit to yourselves in your future practice; it enables you to take in constantly those works which may pass before you on all occasions. If you have this power you will be able to get through a much greater amount of work than would be possible for you without it, no matter how well versed you may be in everything else that relates to your profession. When you have acquired this power of sketching well and freely you can then take up some works, and measure and draw them carefully; by this means you will be doing more to understand their spirit and feel those principles of truth and reason which they contain. It is only when you have carefully gone through this work, and understand thoroughly their plans, sections, and elevations, and their construction, that you can catch their ideas, which ideas once thoroughly impressed on your minds can never be completely effaced. You can use them as your own, without feeling that you are mere copyists. These very ideas will arise in your minds, and will be to you of the greatest assistance when you most require them. Then the power that sketching gives you in educating your eyes and your tastes; when you have the mind filled with the good things which you have already seen and sketched, it will not be possible for you to be satisfied yourselves, or to satisfy others, with what is unreal or bad. It will give you an easy path over many difficulties, and the fears that may perhaps arise when you have planned an original group will soon disappear, if your minds are stored with those ideas which have been formed long before in your sketching tours. You will then avoid starting with a sham. This is a very serious evil, and one against which you will have carefully to guard—this endeavour to appear what we are not.

Sketching and measuring also lead on to the closer examination of those works you take up, and give you a power of thinking for yourselves otherwise very hard to attain; you will find out the points of them that please you most, and will be enabled to mark carefully the treatment adopted for different works, and how the various difficulties were overcome; and, though last not least, it will give you a thorough knowledge and power to use the materials in their best and most natural manner. You cannot love those buildings too much, nor is there any fear you may become copyists if you approach them in a proper spirit, determined to educate yourselves by them, not to select a piece of them for a particular work. It is impossible for a man who loves his art well not to cultivate it, and derive pleasure from its practice, which will be utterly impossible to a mere copyist. The study of those works will also tend to tone down that spirit which would perhaps sometimes tempt you to do queer things, in order to indulge in what is termed "originality." That which is natural will produce sufficient originality. In fact, to my mind, if you make use of your wants properly and naturally you shall always produce that originality which is desirable; truth in planning and in construction will always produce as much of it as is necessary to make our architecture picturesque and beautiful. It is the absence of truth in our architecture, coupled with the want of art education, that produces the thoroughly uninteresting character of almost all our buildings. That which is actually bad and inconvenient is adopted, more particularly in our dwellings, because the public mind cannot realise the fact that truth should govern our architecture; that spirit of doing what has been already, though very badly done, appears yet to govern the masses, and they dread anything in the way of real art in architecture.

Then whim must be avoided; that spirit of singularity which is occasionally visible—that restless, uneasy striving after effect which marks conceit or disregard of truth. This uneasy spirit generally arises from ignorance in treating the materials we have in hand, or the neglect of the study of those models we have been speaking of, but generally in that absence of truth. Truth is the real foundation of good design. You should approach each work in its true spirit, endeavouring to meet each case on its own special merits, making the design as natural and as suitable as possible.

You should above all avoid laziness in design; you must quit that spirit of mere imitation which your ease would sometimes prompt. You should blush to copy or to make use of any of the works you may see in your principal's office; you should imitate what you find there in order that you also may one day become original. The practice of copying and making up a design of another's works, and trying to deceive yourselves thereby that you have designed a building, is a most dishonourable practice, and it is utterly opposed to the true spirit of art. Once you rest satisfied with mere copying in this respect, you are lost to the spirit of the true artist, and you cannot take any pleasure in your profession. The true architect is always contriving, and never rests satisfied until he is convinced that he has realised the best effect possible. He goes on, ever improving on the past, till, when old age comes on, he feels himself young still in the pursuit of art, and there will be no fear that his work will become uninteresting to him. The ever-changing, ever-grappling with the work will be to him a constant source of pleasure, and he has his own reward in contemplating the life-like creations of his fancy—than which I know no greater pleasure. You have many opportunities for variety in your practice, for although sameness in general appearance is too generally sought for, yet in very few cases does one client wish to have that which has been already adopted by another. If you go into each work with spirit, it will prevent poverty in design, and produce that originality which we should all look for.

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OXFORD.

THE restoration of Christ Church Cathedral is still in progress. Among other improvements commenced, the most important is the lengthening the nave 20ft. at the west end. A new western wall of Taynton stone has been built against the College buildings, in keeping with the present nave. A pillar has been erected on each side, and arches turned corresponding with the work of the present nave, and temporary walls have been built between the pillars and end wall, which can be removed at any future time, should it be found necessary to extend the aisles. The portion which is being added to the cathedral will form an ante-chapel, and an oak screen will be placed across, separating it from the other part of the edifice. The cathedral has been reseated throughout. At the entrance to the choir, on each side, will be seats with carved canopies, set apart for the use of the dean, sub-dean, and canons. The pulpit has been removed from the north-west pillar of the tower to the south-west pillar, and the canopy has been replaced over it. The marble floors are completed, and a new credence table has been placed on the south side of the altar. Gas has also been introduced into the edifice. The whole of this work is being done by Mr. Symm, builder, S. Giles's, from designs by Sir Geo. Gilbert Scott. A new altar of cedar-wood, with carved caps and bases, has been placed at the east end of the cathedral. On the surface of it are five small ivory crosses. A new oak door with ornamental ironwork has been placed in at the east end of the approach to the trefolium. There has also been a new door made to the vestry under the tower at the entrance to the south transept.

The alterations and repairs to the chapel of All Souls' College, which were begun more than twelve months since, are nearly completed. The exterior part of the walls have been taken down and rebuilt with Bath stone from the Box quarries, and the buttresses have been rebuilt in the same kind of stone, and the whole of the pinnacles, parapets, and copings in Ketton stone. The ten large windows are also new, and also four in the ante-chapel, whilst the others have been restored. The reredos, which was discovered in the chapel a few months since, has not yet been restored, but will be shortly. The floor of the ante-chapel has been laid with Portland stone. The roof of the college, extending from the chapel in Catherine-street to the Warden's Lodgings in the High-street, has been stripped, firred, boarded, asphalted, raftered, battened, and covered with Westmoreland and Stonesfield slate. The statue of Judge Blackstone has been repaired and removed from the ante-chapel to the east end of the library. The whole of the above work has been carried out by Mr. A. Kimberley, of Banbury.

New College is being considerably enlarged, at a cost of upwards of £20,000, and a further enlargement is contemplated. The architect is Sir George Gilbert Scott, and the builders Messrs. Jackson & Shaw, of Westminster. This new building is intended to give 40 additional sets of rooms to the college, two being for fellows and 38 for undergraduates, besides two lecture-rooms. It is situated on the north side of the college, in Holywell-street, where several houses have been pulled down to give place to it. Its length will be 177ft., its depth 33ft., and height from the bottom of plinth to the ridge of the roof 62ft. There will be four sets of staircases to the building, which will consist of basement, first, second, third, and fourth floors. The servants' rooms, coal cellars, and other offices, will be in the basement, and the lecture-rooms on the ground floor. The external dressings and ashlar work will be of Milton stone, finely chopped, and the internal portion of the walls will be of brick. On the south side at the west end of the building a tower, about 26ft. square and 70ft. high, will be erected, projecting about 22ft. beyond the building, and in the angle there will be an octagonal staircase, which will add greatly to the appearance of the south elevation. There will eventually be a gateway tower erected at the eastern end, but that is not included in the present contract. The windows principally will be square-headed—except in some portions of the elevation which juts out beyond the main line, where they will be pointed, and have labels running round them, and carved terminals—and filled in with mullion-cusped heads. The building is expected to be completed by Christmas, 1873.

The restoration of the Hall of Merton College, which was commenced in May last, is in progress. The cost of the work will be upwards of £4,000, and it is being carried out by Mr. Booth, builder, of King William-street, London, from designs prepared by Sir G. G. Scott. The whole of the exterior of the hall has been completely renovated. The old buttresses have been taken down, and new ones, with proper plinths and mouldings, have taken their place. All the Headington Ashlar has been removed, and the walls refaced with Taynton stone. A new archway has been placed in the porch, together with new steps and wing walls. A new open-timbered oak roof has been substituted for the old one. The alterations in the interior have not yet been completed. They will comprise some improvements in the music gallery and screens at the west end, and at the east end there will be canopied seats raised upon a dais.

Various improvements and alterations have been made in the chapel of S. John's College. Some new panelling has been placed in the screen dividing the chapel from the ante-chapel, and three seats have been placed against it, on each side of the entrance inside, where there were formerly but two. Three stained glass memorial windows have been erected. A carved oak soffit has been placed under the organ gallery at the west end of the chapel. The roof of the front portion of the college has been re-covered with Westmoreland slate, and some new windows, gablets, and chimneys have been erected in the front of the college, with Box and Portland stone. The whole of the work, with the exception of the stained glass windows, has been done by Messrs. Geo. Wyatt & Son.

A great improvement has been effected at Magdalen College. The posts and rails under the elm trees, in what used to be known as the Gravel Walk, have been replaced by a handsome dwarf wall with moulded coping, constructed by Messrs. Knowles & Son, and surmounted with wrought-iron railing by Messrs. Gill & Co., from the designs of Mr. Buckeridge, architect. A portion of the wall at the west end of the school has been taken down, and the narrow entrance to Long Wall-street from the High-street has been widened.

An entirely new parapet has been erected by Messrs. George Wyatt & Son on the north and south sides of the tower of Brasenose College, and also throughout the whole length of the building in Brasenose-lane. Several new chimney-stacks have also been erected, and new dormer windows placed in the front quadrangle, besides other ordinary repairs to the college. This work has been carried out under the superintendence of Mr. Buckler, architect, of Oxford.

A great portion of the interior of Queen's College has, during the Long Vacation, undergone repair, the renovators being Messrs. Wyatt & Son, and Messrs. Knowles & Son.

The east and west roofs of the front quadrangle of Pembroke College have been re-covered with Westmoreland slate, and some internal repairs done to the college by the above-mentioned builders.

During the Long Vacation Messrs. Wyatt & Son's men have been busily engaged in making alterations and improvements in Wadham College. Some extensive repairs have been effected in the wardens' rooms, and a conservatory is being erected on the north side of the same. Other portions of the college have been put into thorough order.

A new stone parapet has been erected in front of the back quadrangle, and sundry repairs have been done to the interior of Trinity College.

The roof on the west side of the back quadrangle of Lincoln has been re-covered with new Stonesfield slate, and the roof of the stabling, &c., has also been re-slated. This work was done by Messrs. Knowles & Son.

A large building is being erected at the southern end of Keble College as residences for the servants. Mr. Butterfield is the architect, and Mr. Franklin, of Deddington, the builder. A chapel for this college is shortly to be commenced. It is estimated that the cost will be from £25,000 to £30,000.

The projected improvements in the interior of the Chapel of S. Mary Hall are only in part completed. The stonework of the east window has been renewed, and filled with painted glass by Mr. Clutterbuck, of London, but it is not yet open to view. The pointed shape of the roof has been retained; it was of plaster, and is now framed in panels, with carved bosses at the intersections of the mouldings. That part over the chancel is somewhat more ornamented than the rest. The south windows have been reconstructed, their splays having been deformed by the concealment of the hall flue within the thickness of the wall, but these defects have been remedied. Some seven or eight feet have been added to the length of the chapel, and a spacious organ gallery formed at the west end. The architect is Mr. Buckler, and the builder Mr. Fisher.

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ARTIFICIAL STONE *VERSUS* BRICKS.

Dr. ADOLPH OTT recently read a paper before the Polytechnic Club of the American Institute on Portland Stone, Cement, Stone, and Brick. He said: — European experience, extending over a period of more than forty years, has established the fact that constructions of Portland cement or beton will resist the influence and changes of climate equally as well as the very best building-stones. Portland-cement stone, if properly made, is almost impervious to water, while this cannot be said of brick and sandstone. Since warmth and moisture are peculiarly favourable to vegetable growth, these latter building materials are more liable to disintegration than others with less absorptive power. The resistance to frost is absolute, even in structures the roofs of which are terraced with this material. With regard to the absorption of moisture of brick, Mr. Edwin Chadwick, who was appointed to report upon improved dwellings at the Paris Exhibition, says:—"There is another great source of evil attaching to walls of the common brick and common soft stone construction—the absorbency and retentiveness of water or damp. In England, the common bricks absorb as much as a pint (or pound) of water. Supposing the external walls of an ordinary cottage to be one brick thick, and to consist of 12,000 bricks, they will be capable of holding 1,500 gallons, or six and a half tons, of water. To evaporate this amount of water would require three tons of coal, well applied. The softer and more workable stones are of various degrees of absorbency, and appear to be more retentive of moisture than common brick."

When it is considered that Portland-cement stone is non-absorbent of moisture, it will not appear strange that houses built of it are from eight to ten degrees warmer in winter than houses built of brick. Speaking next of resistance against fire, Dr. Ott says:—To any one acquainted with the chemical composition of cement stone, it must at once become evident, that, with regard to its resistance against fire, it ought to supersede most building-stones. That this is really the case we learn from several reports before us, given on the "Frear Stone," which was used in the construction of several buildings in Chicago, and which is essentially a cement-stone. Merrill Ladd, Esq., President of the Mutual Life Insurance Company, of Chicago, writes as follows:—"In passing through the '*great fire*,' no signs of flaking, splitting, or disintegration was perceptible, as was the case with all natural stone (even granite) which was used in this city. I will say, in conclusion, that I believe it to be the best material that can be used for building where strength, solidity and protection against fire are desired."

Also Professor McChesney, the geologist, says: "I examined its condition just after our great fire, where it had been exposed to as severe tests as any building material in this city; it was neither cracked nor scaled off by the great heat so badly as the real stone used in this city; and, on examination closely, the heat had not penetrated but about 2in. in any instance, from which I conclude it might be used to advantage in the construction of fireproof vaults."

I would gladly add other testimonials, if I did not fear that I had already occupied more space than is usually assigned to such papers.

As to the cost, Messrs. Bandman & Jaffe, manufacturers of cement stone in New York, give the following estimate for the cost of 100 cubic feet of cement, viz.:

	Dols.
87 cubic feet of broken stone and sand	3 00
13 cubic feet of Portland cement at 1·25 dols. per cubic foot	16 25
Labour	3 50
Total............	22 75

If hydraulic lime be used instead of cement, say five parts lime to two parts of Portland cement and eight of broken stone and sand, 100 cubic feet of superior wall can be built, according to close calculation, for 16·75 dols. This is less than one half the cost of construction with brick and mortar.

Lintels, sills, caps, and arches can all be made at the same time, and with only a slight increase in expense. The partition walls need not be 8in. in thickness; 4in., or at most 5in. will be sufficient.

I will here remark, that by the addition of proper colours, the brown stone of New York city is imitated so accurately in Portland cement stone, that the eye can scarcely detect the difference. With regard to the proportionate cost of these two stones, I would state that the price list of one of the companies in this city shows that the rates for ashlar, caps, corner-blocks, keys, &c., range from one-half to one-third those usually paid in this market for blocks of cut brown stone of corresponding shapes.

For such stone, as well as for ornamental work, only fine washed sand is used as an admixture for the cement. The cost of artificial stone being so much greater for plain work, it is evident that the difference must be much greater for ornamental work; for the cost of producing the most elaborate designs, the moulds being once made, it is but little more than that of the simplest blocks. When we consider that in the ornamentation of our public and private edifices there is no limit except that of design, and that duplicates of celebrated statuary can be furnished with ease, it is at once apparent that the invention of Portland cement is to sculpture and architecture what photography is to the arts of drawing and painting.

Lastly, referring to its uses, Dr. Ott says:—With regard to the uses to which Portland cement can be applied, it may be remarked that they are almost innumerable. For submarine constructions, there is no material which can take its place, be it for concrete, or in blocks, or as mortar in brickwork. For bridges, cisterns, aqueducts, and sewers, it is in great demand. For flagging and sidewalks, its use is daily extending. As it is impervious to water, and can be laid in a continuous surface, no heaving or disturbance can result from frost in the ground, provided it be properly drained. There is no material better adapted for the construction of cheap and elegant dwellings. Those who visited the Paris Exhibition of 1867 will, perhaps, remember the row of dwellings near the Bois des Vincennes, which were models of convenience for families, as well as of cheapness in construction. They were executed after the ex-Emperor's designs, and present one monolithic structure of beton.

Foundations for machinery in beton are cheaper than stone masonry, and quite as good. For engines, a cubic yard of foundation corresponds to one horse-power; and thirty horse-power would require, therefore, thirty cubic yards. Water-pipes of the same material are made at half the expense of those of iron, and they cost little for repairs.

Furthermore, it is especially serviceable for floors in damp or wet cellars in private dwellings and warehouses, and for floors in granaries, sugar-refineries, breweries, and malt-houses; and it is also being used for gasometer reservoirs and reservoirs for petroleum. And, as an instance of one of the most recent applications of the cement in question, I mention the coating of the inside of iron ships.

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Belfast Architectural Association. — On Monday evening last a meeting was held in Messrs. Young & Mackenzie's office, Calender-street, for the purpose of forming an Architectural Association for Belfast. John Lanyon, Esq., architect, occupied the chair. There was a large attendance of those connected with the profession. Resolutions were unanimously passed approving of the formation of such a society, and a committee was appointed, with Mr. R. Young, jun., as secretary, for the purpose of framing a set of rules and arranging for future meetings. Much interest was evinced by those present in the objects of the Association.

The Board of Works and the Temple.—At the last meeting of the Metropolitan Board of Works, the construction of a suitable fence between the Temple Gardens came under consideration, and was ultimately referred back to the Works and General Purposes Committee for consideration. By the Thames Embankment Act, 1862, the Board are required to erect along the Embankment roadway an ornamental wrought-iron fence, fixed upon a dwarf wall of stone 3ft. in height, with gates therein, and return walls at the eastern and western ends of the garden, also with gates, to the reasonable satisfaction of the Societies of the Inner and Middle Temples; and the engineer states that the cost of these works would probably amount at the present time to about £7,000. This sum the Board consider a very extravagant one, being at least double the amount expended on its own inclosures on the Embankment.

IMPROVED INDUSTRIAL DWELLINGS COMPANY.

THE second block of buildings in Ebury-square, Pimlico, which have been for some time in course of erection by the Improved Industrial Dwellings Company, is now finished. The first block was opened about twelve months ago, and the second block, just completed, is on the north side of the square, the chief entrance being close to the Grosvenor Working Men's Club, at present in course of erection. A wide staircase leads to the several stories above the ground floor of the building. There is a large area or courtyard within the block (which contains six stories on the side looking into Ebury-square, and five stories on the other side and at the end. Ornamental iron balconies run round the entire block at the front of each story, protected by iron railings between 3ft. and 4ft. in height; and from these balconies access is gained to the several dwellings, which are altogether sixty-four in number, some of them having two, whilst others have three and four rooms each. Attached to each dwelling are separate domestic conveniences, every tenement having its own scullery, containing copper, sink, coal-place, dust-shoot, and other necessaries. There is a kitchen-range in each dwelling-room, although the stove in the scullery is easily capable of being converted into a cooking apparatus. Some of the larger rooms are 13ft. 8in. to 13ft. 11in.; the bedrooms are 8ft. by 6ft., and 9ft. by 6ft., the uniform height of the rooms being 8ft. 3in. The ventilation of the premises is effected by means of a ventilator placed in the ceiling of each room, which communicates with air shafts running through the centre of the blocks. Drainage is thought to be secured by pipes passing from the top of the building down into a large syphon-trap, with an up-cast ventilating pipe, and from the syphon-trap direct into the main sewer. Covered receptacles at the base of the building receive the dust passing down through the dust-shafts, each shoot being provided with an iron cover to prevent the escape of dust. The block has a flat roof, with an iron railing running along the edge, which serves for drying purposes. The rents range from 1s. 3d. to 2s. 3d. per room per week, which includes rates and taxes, and water and gas supply. The builders are Messrs. Matthew Allen & Sons, Tabernacle-walk, Finsbury. The company is about to build three more blocks, two of which will be in Commercial-road, Whitechapel, and the third on a piece of vacant land at the corner of Blackfriars Bridge. The Marquis of Westminster has offered another site in Pimlico, which the company has determined to purchase.

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HANLEY SCHOOL OF ART.

THE annual meeting of the Hanley School of Art was held on Thursday week. The Mayor, who is hon. secretary to the school, read the report, which announced the continued and growing success of the institution, the increase of students during the past year having rendered additional accommodation necessary. The school had been placed fourteenth on the list of 115 schools of art in the kingdom, and the master awarded a bonus of £20, in addition to which one gold and two silver medals had been awarded to students. The committee regretted there was a balance against them of £102 2s. 11d., while thanking those who had supported the school with subscriptions.—Mr. A. A. Bradbury, the head-master, read his report, which gave the following comparative statistics of the school for the past two years:—Number of second grade subjects passed in, 66, against 36; prizes, 17, against 11; number of drawings, paintings, and models executed in the year, 927, against 620; number of students' works examined at South Kensington, and marked "satisfactory," 59, against 36; third grade prizes, 15, against 14; free studentships obtained, 7, against 5. The results of the second class examination were 83 per cent. above last year. The school, in respect to medals, stood ninth in the 115 schools of the country. In no previous year had the attendance at the school been so large as during the past year, when the average attendance of artisans was 118, against 82 in the previous year. The Mayor read the statement of accounts, from which it appeared that the receipts for the year amounted to £385 8s. 6d., including subscriptions, £107 0s. 6d.; students' fees, £100 0s. 9d.; and the expenditure to £487 11s. 5d.; including an adverse balance of £90 17s. 3d. at the end of last year. There was now a balance due to the treasurer of £102 2s. 11d.

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It is proposed to erect a new pier and harbour for Newlyn, near Penzance, by the aid of a company. At a recent meeting of the shareholders, the plans of Messrs. Trounson & Son, Penzance, were submitted and approved.

Building Intelligence.

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CHURCHES AND CHAPELS.

Brighton.—On Monday, October 7, at Brighton, the memorial stone of a new chapel, in connection with the denomination known as Bible Christians, was laid. The site is at the eastern end of S. George's-terrace, close to the junction of Upper S. James's-street and S. George's-road. The style of the building, described in a local newspaper as Byzantine Gothic (!), it is difficult to characterise, judging from an exhibited perspective. Accommodation is provided for 500 persons, with provisions for a gallery, to be built when occasion requires. The basement of the chapel is appropriated for a Sunday school. The material employed is red brick with Bath stone dressings. The architect is Mr. Thomas Lainson, of Brighton, under whose superintendence the building is being erected by Mr. Fielder, of Chichester, for the contract sum of £2,650.

Chale.—On Tuesday week the church of S. Andrew, Chale, was reopened after restoration. The church is supposed to have been founded during the reign of Henry I., the year being fixed at 1111. Among the principal features of interest are Transition Norman pillars; rude, and nearly semicircular arches, with flat, slightly-chamfered soffits, and one arch pointed, and of two chamfered orders, separating the nave from the aisle; remains of entrance to a rood-loft; niche for figure in the easternmost jamb of a window in the north side of a nave; trefoil-headed piscina, with shelf on south aisle; and remains of Beneltura in the porch. The tower, which is a good specimen of the Perpendicular order, and resembling in many respects that of Carisbrooke Church, is separated from the nave by a lofty, well-proportioned arch. The ten windows appear to be of the same date as the tower—fifteenth century—when the church probably underwent extensive alterations. Traces of painting are to be discerned on the walls and arches. The restoration has comprised reroofing, reflooring, and repewing. The tower has been opened up, and the arches have been relieved of whitewash.

City.—S. Andrew's Church, Holborn, was reopened on Sunday last, after having been closed since Christmas last. During the summer extensive alterations and decorations, which have involved an outlay of more than £4,000, have been executed. The chancel has been raised between two and three feet, and the flooring laid with encaustic tiles, whilst at each side stalls have been constructed for the clergy and choir. The pulpit has been removed to the north side of the church, and now stands upon an elaborately-sculptured pedestal of Caen stone. The old high-backed square pews have all been removed and replaced by seats with low doors in imitation oak. A new organ has been provided.

Manningham.—A new church, dedicated to S. Mark, is about to be erected at Manningham, Bradford, York. The design, in the Geometrical Gothic style, has been prepared by Messrs. Milnes & France, of Bradford. The dimensions are 124ft. by 54ft. The church will consist of two aisles, nave, transepts, and chancel. At one end will rise a tower and slender spire. The cost is estimated at about £5,000.

Morley.—A new Congregational church is about to be erected at Morley, from the designs of Messrs. Lockwood & Mawson, of Bradford. The new church will be 100ft. long by 45ft. across. It will consist of nave, side aisles, and transepts, will accommodate about 850 worshippers, and will be built of Northowram wallstones and Ringby ashlar. At one end a tower and spire will rise to a height of 130ft. The nave will be made rather wider than usual. The centre bays of the nave are to be higher than the other arches, and the windows on each side will be so disposed as to shed a flood of light into the chapel. The staircase opposite the tower will be covered with an octagonal roof. The roof is to be open-timbered. The cost is estimated at £4,000.

Newsome.—On Saturday last, a new church, which has been erected at Newsome, near Huddersfield, and dedicated to S. John, was consecrated. The new church is a stone structure in the Gothic style, costing £3,000. It will seat 410 persons, including 60 children. The architect is Mr. W. H. Crosland, of Regent-street, London. At the east end a stained glass window has been put in, representing three figures—Faith, Hope, and Charity.

Shebbear.—On Friday week the parish church of Shebbear, Devon, was reopened, after restoration. The walls have been looked to internally and externally, the whole of the building reseated, and a gallery removed. The cost of the alterations has been about £600. Mr. Medland, of Torrington, was the architect, and Mr. Hookway, of Bideford, the builder.

S. Paul's, Brighton.—At last steps are being taken for the completion of the tower of S. Paul's Church, Brighton. It will not, however, be finished in accordance with the original design, as it is said that the foundations will not admit of so lofty a spire. A perspective drawing now on exhibition in the Galilee of the church shows the lantern now proposed. The works will be commenced early in the spring. The church itself is thus described in Eastlake's "History of the Gothic Revival":—"1846—48. R. C. Carpenter, architect. Early Decorated. Capable of holding 1,200 people. The chancel is of unusually grand proportions for the time at which it was built. The windows throughout the church are of stained glass by Hardman, from designs by E. W. Pugin and R. C. Carpenter."

BUILDINGS.

London.—On Thursday week a meeting of the Markets Improvement Committee of the Corporation of London was held at Guildhall, to consider the plans and specifications which have been prepared by Mr. Horace Jones, the City architect, for the intended extension of the Metropolitan Meat and Poultry Market, at Smithfield, and also to give directions for taking out quantities and nominating builders to be written to for tenders for the execution of the works. It is anticipated that the works will be speedily entered upon. The cost is estimated at £87,500.

Southport.—The Princess Mary of Teck last week laid the foundation stone of the new Cambridge Hall at Southport. The Cambridge Hall is only one part of a much larger scheme for the improvement of the town which is now being carried out. The whole plan comprises, firstly, the Cambridge Hall, with its various adjuncts; secondly, a total rearrangement of the approaches; and thirdly, a complete reconstruction and great enlargement of the Toy Market. These improvements are now being carried out from the designs of Messrs. Maxwell & Tuke, of Bury, whose plans were selected in open competition. The new hall is being built upon a rectangular plot of land in Lord-street, adjoining the present Town Hall on the southerly side. The length of the frontage of the building is 130ft. The principal entrance to the hall is in the centre of the front. A vestibule with pilasters and coved ceiling leads through a screen to the entrance hall, which is 40ft. by 35ft., divided into sections by arcades of pillars and arches, which are also continued round the walls. The large hall will have an extreme length of 120ft. by a width of 50ft. A gallery runs round the three disengaged sides of the room, and it is calculated that the area of the floor and gallery will accommodate nearly 1,500 persons.

SCHOOLS.

Clapham, Beds.—A new parochial school has been opened at Clapham, Beds. The buildings consist of a mixed school for boys and girls, 42ft. in length, and 19ft. in width, an infant school, 25ft. long by 16ft. wide, with separate entrances for the boys, girls, and infants; these are fitted with hat and cloak rails, and each has a slate lavatory. Attached are places for coals and closets for pails, brushes, &c. Moule's patent earth closets are used, a spacious earth-drying shed being erected, containing a stove for drying the earth. The mistresses' house is a detached building, and contains a parlour, 13ft. by 11ft., a living-room, 13ft. by 11ft., a scullery, pantry, and larder on the ground floor, and three bedrooms on the chamber floor. The interior walls of the schools are of fair brickwork, distempered, and the whole of the woodwork is stained and varnished. Red bricks are used generally in the buildings, with bands and devices of Staffordshire blue bricks, and the window-heads, copings, weatherings, and corbels are of Bath stone. The windows throughout are fitted with ordinary sashes. The buildings are plain Domestic Gothic in style, the architect being Mr. John Day, of Bedford, and the contractor Mr. R. Carter, of Wellington-road, Bedford. Accommodation is provided for 122 children, at a cost of £1,200.

Ipswich.—A Committee of the Ipswich School Board has recommended for adoption by the Board the plans and specifications for an infant school in the California district, Ipswich, sent in by Mr. Butterworth, architect. The Board has acted upon the recommendation. Mr. Butterworth's plans have also been accepted for new schools for the Board in the Wherstead-road, the contract for which has been taken by Messrs. Gibbons & Co. Messrs. Gibbons' tender for new schools for the Board in Argyle-street (Mr. Eyton, architect) has also been accepted, subject to certain conditions.

SALISBURY CATHEDRAL: S. ANNE'S GATEWAY. — CANTERBURY CATHEDRAL: STAIRCASE TO THE REGISTRY.

In our illustration a view is given of the well-known and nearly unique Norman Staircase, Canterbury. It was erected between 1080 and 1085, by Archbishop Lanfranc, who, on his accession to the see in 1070, rebuilt the Cathedral, Monastery, and offices belonging, previously destroyed by fire. The staircase stands at the north-west angle of the Cathedral Close, and forms an entrance to the registry formerly used "by the steward of the courts within the precincts of the priory" to receive strangers, whence it has been called the Strangers' Hall. This hall now forms a school-room for the choristers of the Cathedral. Although the original roof has been removed, a tiled one being substituted, and the walls lowered in height, the staircase is in an excellent state of preservation. It has already been pointed out, and is worth mentioning, that much of the ornamental foliage which enriches this specimen bears a considerable resemblance to the ancient Greek honeysuckle found used in the temples of Minerva Polias. Erectheus, and the Choragic monument of Lysicrates at Athens.

S. Anne's Gate, Salisbury, which forms the north entrance to the Cathedral Close, is one of the many unpretending but suggestive specimens of Domestic work found in the precincts of our cathedrals. It was probably built when Edward III. gave permission to the Dean and Chapter to enclose their canonical residence with a wall built of stone. From the Norman character of the ornaments on many of the stones built in the Close walls it is evident that much of the material employed was brought from Old Sarum, when that ancient cathedral was pulled down and the present structure built.

Maurice B. Adams.

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DESIGN FOR SIDEBOARD.

One of our illustrations of this piece of furniture, which has been executed for Frederick Bird, Esq., of Windsor, by Mr. Robinson, of High Holborn, from the designs of Messrs. Satchell & Edwards, exhibits a plain and accommodative sideboard of Mediæval character, relieved by a slight amount of carving, and the judicious use of coloured decorations on tiles for the lower portion, and on a gold diapered ground above, blending harmoniously with the subdued tint of the American black walnut wood of which the sideboard is constructed.

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CONCRETE HOUSES ON THE ESTATE OF ROSSIE PRIORY.

Lord Kinnaird has just erected at Castle Hill a two-storied house built of concrete, for the occupancy of the clerk of the works of the estate, and he is at present engaged in building an addition of the same material to a house on another part of the estate. The experiment has been eminently satisfactory, and the *Whitehaven Herald* understands that his lordship has at present in contemplation to build a number of cotter houses of the same material. The plan of erection is perfectly simple. Upright posts about 7ft. high are erected at what are to be the corners of the house. A double boarding 21in. in height is placed longitudinally between the posts, and this boarding is made to work upon screws, so that the wall can be made of any thickness desired. Into the cavity formed by the boardings (which in the case of the house at Castle Hill are 12in. apart, that being the thickness of the walls) rough boulders of any kind are laid, care being taken not to let them touch the boards, between which and the stones space is left for the concrete. This is made up of one part of Portland cement to seven parts of fine broken metal or gravel. These are mixed in a bucket and poured in between the boardings, and twenty-four hours being allowed for the whole to harden, the boards can then be raised, when a fine solid wall, 18in. high and 12in. thick, presents itself to the view, and the process repeated on the top of the hardened concrete as often as is necessary, until the walls are brought to the height required. The doors, windows, and fireplaces are formed by fixing a rough frame into the boarding, which excludes the concrete from such a space as may be wished. The thickness of the walls can also be varied as they are raised, and in the instance of the house at Castle Hill, while the walls of the lower story are 12in. in thickness, the upper story is only 9in. thick. Instead of gravel, with which the Portland cement is usually mixed in making concrete, his lordship, who has a stone-crushing machine for breaking road metal, has utilised the fine metal, which was of no use for the roads, and this substance is found to answer admirably.

THE DAVY MONUMENT, PENZANCE.

On Tuesday this monument was unveiled by J. R. Bramwell, Esq., the Mayor of Penzance. The monument is placed at the top of one of the principal streets, and was erected from the design of John Trounson & Son, architects, Penzance. The pedestal rests on a base of unwrought granite 10ft. square, consisting of four blocks each, weighing over eight tons. The pedestal itself is of the best blue Lamorna granite. The sub-plinth consists of one block 8ft. square, 2ft. 6in. high, and weighs over 11 tons. The plinth is of one block 5ft. 4in. square by 2ft. 4in. high, and weighs five tons. On this is placed the dye, a massive stone 4ft. square, 5ft. high, in the centre of the front-face of which the name of the great Cornishman, "Davy," is cut in relief. This is surmounted by the cornice, formed of one stone 5ft. 6in. square, 10in. thick. The mouldings of the cornice are very finely cut, and form beautiful examples of the capabilities of the Cornish granite for the delicate work of the chisel. On the cornice rest two blocks to receive the figure. The weight of the base and pedestal is about 60 tons. The figure is a well-executed colossal statue of Sir Humphry Davy. The features are admirably represented, and one of the most useful works of his valuable life is symbolised by a model of "the safety lamp," which he holds in his right hand. The figure is 8ft. 6in. high. The erection of this monument, to the memory of one of England's most distinguished men, is mainly due to the energy and perseverance of some working men of Penzance, conspicuous amongst whom is Mr. John May, who for many years has devoted himself to its accomplishment. The sculptors are Messrs. W. & T. Wills, of Euston-road, London; the contractors Messrs. Freeman & Sons, of Penzance and Penryn.

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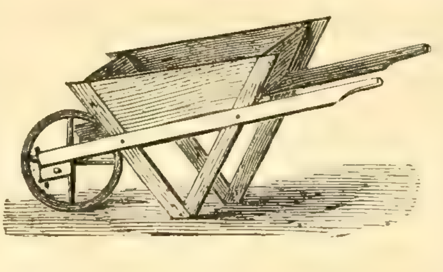
NEW FORM OF BARROW.

The new form of barrow shown in the accompanying illustration has been recently registered. The inventor claims for it that while it can be made quite as cheaply as any of the ordinary designs, its durability is tenfold. It cannot easily be broken, for, as will be seen, the legs are bolted through the frame and secured by a couple of screws at the ends resting on the ground, a construction which renders them far less liable to break off. Iron stays or cleats are dispensed with as unnecessary; and the body may be constructed of the requisite shape to suit any special requirements.



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GLASS PAINTING.

In his sixth Cantor lecture delivered before the Society of Arts, on "Silicates, Silicides, Glass, and Glass Painting," Professor Barff spoke as follows on the Art of Glass Painting:—What style of glass-painting ought we to adopt now. I know there are many artists and architects who say that now we ought to stick slavishly to the old styles, and imitate them, if the churches where they are to be used are built in those styles. What style are we to use? As to the arrangement of the ornament and canopies, that must be left for the architect. As for the arrangement of the groups of figures, and the general style of treatment, it appears to me that there is one general style for all. We can learn much from our forefathers; they had great experience, and in some respects knew more than we do. We have a transparent substance—which is our medium of decoration. Now, are we to obliterate its transparency; is the window to be put there to be stopped up by something which prevents the light passing through it? Certainly not. I think you will all agree with me that to do this is wrong in principle. Here is a design for a window—a really beautiful design, no doubt—which you may see executed in S. Paul's. It was painted in Munich. But if you go and look at it you will not see a piece of clear glass in it. The whole thing has been obscured with enamel, so as to make it a transparency hardly superior to a well-painted blind. It may be beautiful, but is it right in principle that that through which light should come should be the means of blocking the light out? But you may say you do that with coloured glass in all instances. I say, no, we don't; what we do is this—we sift the light as it comes through; we choose to break up the ray of light into its constituents, and send some of its rays through the blue, some through the red, and some through the yellow. But the true artist in glass, the man who understands the end for which he is working, will say we are only doing with our glass what you would do with the prism, and we expect in our arrangement to do what you would do with another prism—cause the refracted rays to meet again and produce white light. We only take from the intensity of the light somewhat—we do not destroy it. We give you the effect of white light, and any treatment of stained glass, the composition of which producing an effect upon the eye of purple, green, red, or blue is, I take it, wrong in principle and unsatisfactory in practice. We must have such an arrangement as will produce upon the eye the effect of subdued white light, and this effect is very easily produced. The windows in the Temple Church were made after the revival of Gothic art, and were very meritorious, because they were steps in the right direction; but if you go into that church and look at the windows over the Communion Table, you will see there purple windows. But the artist did not mean them to be purple. Go and look at the windows in S. Chapelle, Paris, which were executed by a Mediæval artist with a different kind of blue glass, which shuts off nearly all the other rays but blue, and you do not see purple windows. That glass is coloured with protoxide of copper, as well as oxide of cobalt. Glass-painting is an art. I do not put it at all on the same level with the painting which we use for decorating walls; it is not the same as wall-painting, and any man who attempts to produce the effect of wall-painting on glass makes a very great mistake. For instance, here are specimens of landscape-painting on ground glass. They are well done, but they are simple transparencies, and it is impossible to get the effect of this kind of painting upon glass unless you go in for the same amount of intense shadow you have there, and if you do that you destroy the transparency of your glass. Then we come to the question as to what churches are suited for stained glass. Some architects and artists hold the opinion that stained glass should be confined entirely to what is called Pointed architecture. Now, I know there are churches without end on the Continent in which windows are painted in the style which has received the name of Cinque-cento, and on the wall there is a design of a circular-headed window, designed by Messrs. Lavers in that character. It is a system of glass-painting adapted to that particular kind of window, and to churches which do not belong to the Pointed style of architecture. Question has been raised as to whether stained glass should be introduced into S. Paul's, that is, stained glass representing subjects. I see no reason why it should not. It is asserted that the walls are to be decorated with frescoes, and that subject windows would destroy the effect of these. Certainly, such windows as those which I have just alluded to are most objectionable; but there are some there, executed, I believe, by Messrs. Clayton & Bell, which would produce no injurious effect on any fresco. If the colours be so arranged, and the subjects so designed, that the effect of white light, as nearly as may be, be produced, the introduction of stained glass would greatly add to the beauty and solemnity of the proposed decorations, and would not interfere with that dim religious light which people so much admire in ancient cathedrals—and admire with so much justice—a light which tones down the whole of the building, and throws into prominent light and deep shadows those beautiful details of architectural moulding which the architect himself has taken so much trouble to design, in order that he may be able to add to the enrichment of the building, but which is destroyed by the cross glaring lights coming in from all quarters, as we see in so many of our more modern ecclesiastical buildings.

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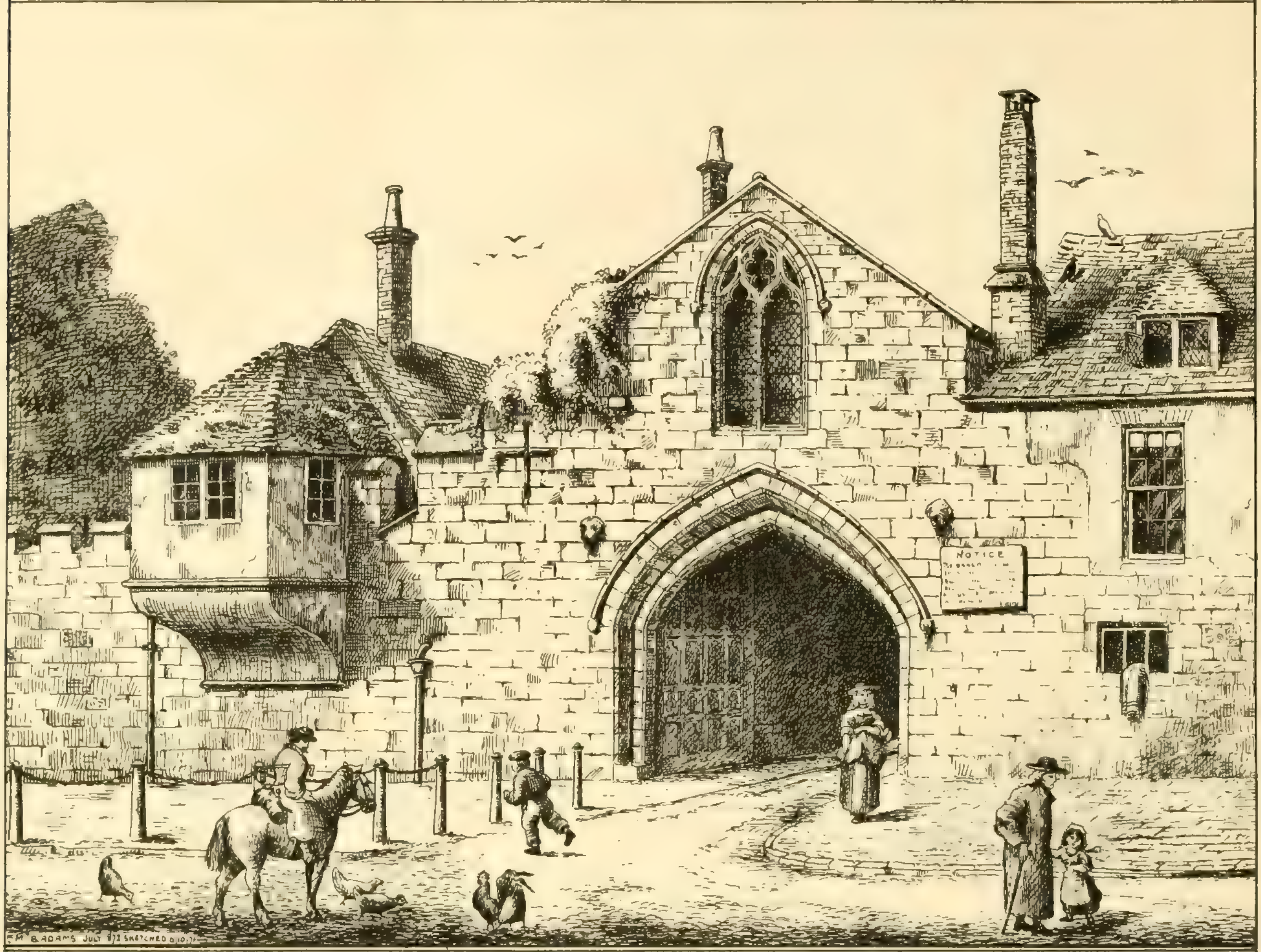
A Precedent for Vestrymen and Others.—At the last meeting of the Vestry of the Parish of S. George's East, the question of the election of a surveyor in the place of Mr. Wilson, lately deceased, came under consideration. One of the vestrymen proposed to advertise for candidates as usual, but another very sensibly observed that, as the majority of the Vestry had made up their minds to elect the son of the late surveyor, advertising was unnecessary. The Vestry took the good advice offered, and a number of persons will thus be spared the trouble and annoyance of competing for a situation which to all intents and purposes had been already filled.

SALISBURY CATHEDRAL ST. ANN'S GATEWAY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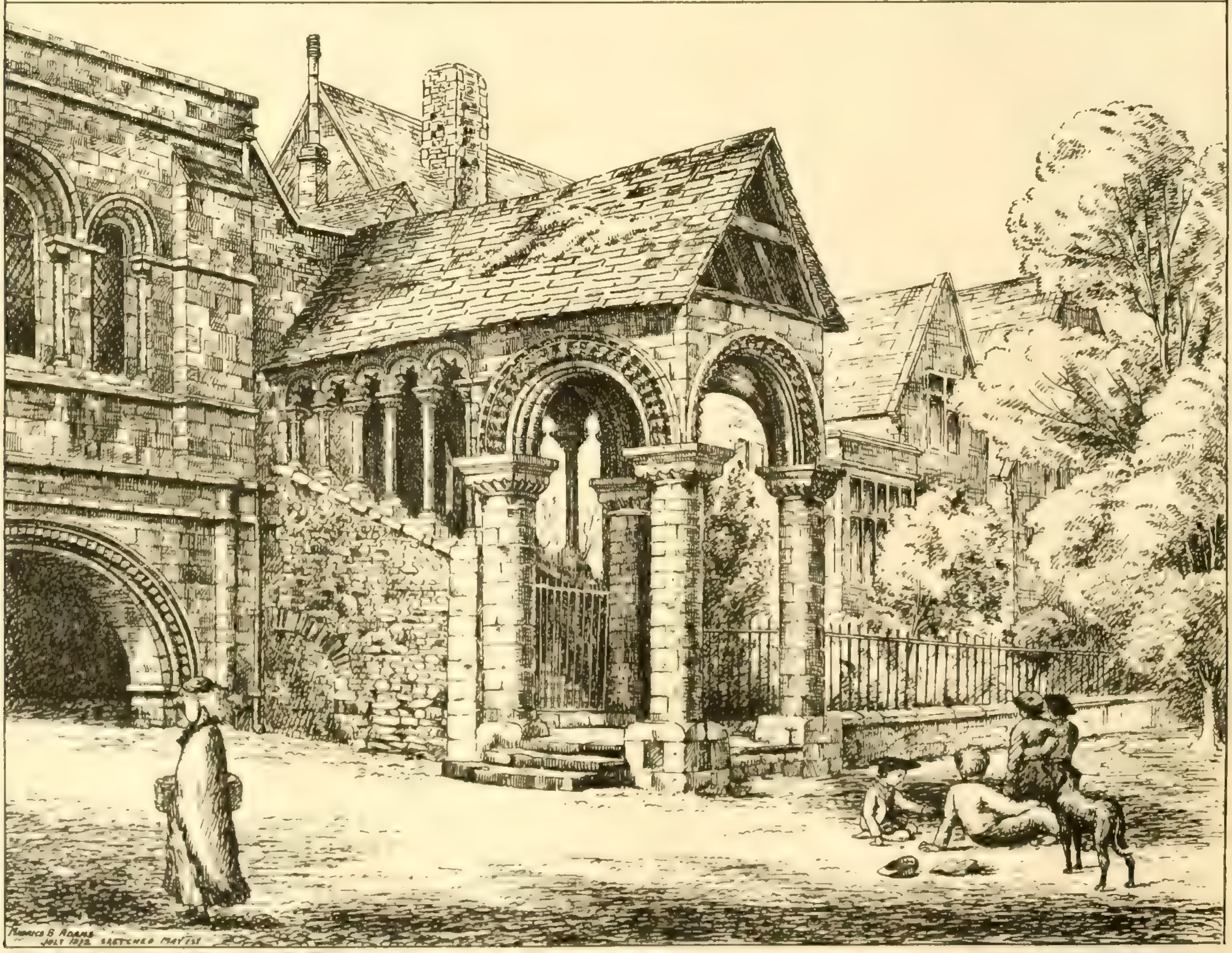
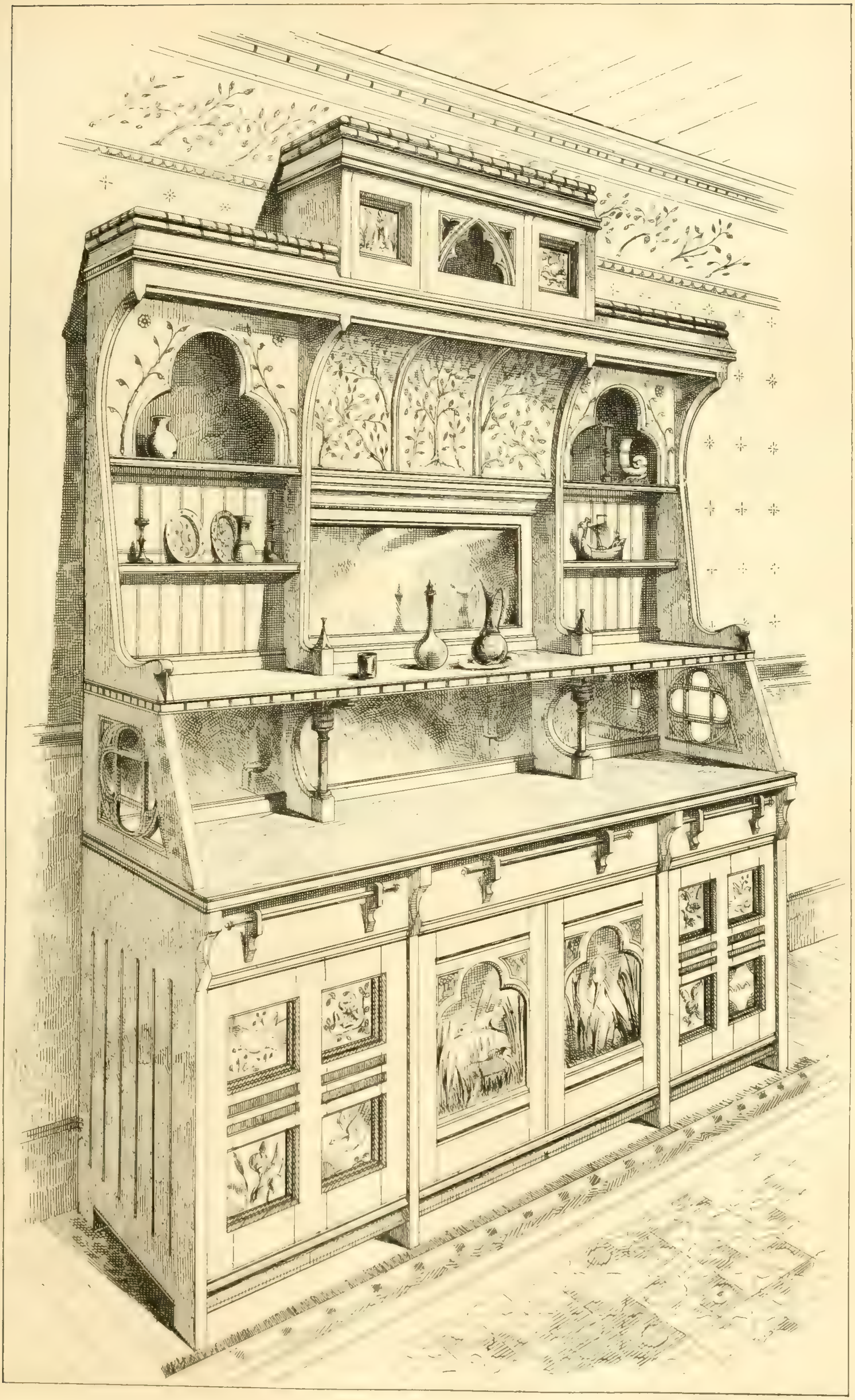
·CANTERBURY·CATHEDRAL·—·STAIRCASE·TO·THE·REGISTRY·





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SIDEBOARD:— EXECUTED FOR FRED. BIRD, ESQ., WINDSOR,
BY M^R ROBINSON OF HIGH HOLBORN, FROM A DESIGN BY SATCHELL & EDWARDS.

CHURCH RITUAL AND ARCHITECTURE.

At the recent Church Congress at Leeds there was a lack of that advanced and scientific element of thought which constitutes the value of the more interesting gatherings and discussions of science. The ritualistic aspect of church matters was too largely represented, for though the President, in his inaugural address, aptly called attention to the necessity of widening the sphere of the Church establishment, and making it so comprehensive as to include the various sections and divergences of discipline and opinion, the result of the whole of the discussions is clearly the preponderance of precedent and conventional usage. The clergy again have had it their own way. So long as the sacerdotal pretensions of the Church hold the leading position, to which the lay element or the congregational idea is subordinate, the Church must ever remain powerless and inefficient for her mission. There will doubtless always be the three elements of religious thought represented by the Ritualist, the Rationalist, and the Evangelical, so long, indeed, as the human mind is differently influenced, and to meet such diversity there should exist, doubtless, different modes of exercise or worship corresponding to these three conditions, and it would be a great mistake to make an iron rule of uniformity. No such rule, however, could possibly exist now-a-days, as every man is more or less a law unto himself. This being so, uniformity in church design and building is equally untenable. No doubt, a splendid ritual and gorgeous decoration has enlisted a large body of our church architects, because it affords a wider field for artistic power and display than a simple unadorned one. Here is evidently an identity of interest; church ritual and decoration are as one to the architect, and he would be opposed to his own success if he did not develop the accessories of such externalism. It is, then, not to be wondered at that church architecture and ritualism have grown together and been mutually strengthened; hence the difficulty the independent architect encounters in striking out any new plan. He has the clergy, or the majority of them, and the leading popular church architects of the day, against him in such an effort. It is not to be denied that this simultaneous movement of the ecclesiastical and æsthetic impulses has promoted a truer feeling for, and infused a more energetic spirit into, church art, though it also must not be forgotten that the fundamental principle of all true art—namely, "fitness," or a truthful expression of purpose both in plan and detail—must not be lost sight of if church architecture is to take a prominent place among us. It is too obvious that a kind of sentimental straining after Mediæval feeling and taste is overbalancing the more important requirement of church arrangement. The triple division of nave and aisles has, for example, no meaning, unless a symbolic one, for the requirements of a small church, and yet it is persistently adopted in almost every case, entailing expense of construction and internal inconvenience. As I have before observed, in an "Essay on Church Arrangement," especially town churches, there are many better and simpler plans, as the Greek cross, in which only four piers are required, and a large area for seating obtained. Every one in such a space could both see and hear, and, architecturally, a dignity of treatment would be attained. There are several good precedents for such a simple arrangement, and the Building News contained some good types in a recent volume.*

The roofing of wide areas is now practicable, and there is no reason why the Incorporated Church Building Society should impose on architects a limit of 24ft. or thereabouts, nor insist on the use of tie-beams, a not very artistic feature, however attenuated they may be made. What use, indeed, is our advanced knowledge of materials and scientific timber trussing if we are content with reproducing the timber roofs of periods when the knowledge of framing was in its infancy? Again, it may be asked why we affect the massive proportions of many features of early Mediæval architecture when materials are of considerably more cost, and when we may dispose the thickness and form of our masonry in such a manner as to give us all the needed strength without buttressing. Similar questions may be raised of a great many details of our churches — namely, window tracery, pillars, woodwork, &c., in all of which the semblance of antiquity rather than the *fitness* and common-sense principles of these matters is attempted. Angle buttresses, for example, are really seldom needed except when we require greater footing or abutment, as when an arch is carried or when a considerable weight of superstructure has to be sustained on a small area. In fact, wherever the influence of ecclesiastical thought is strongest we find a forced archaic expression or ecclesiasticism of idea. Archaism of idea and type is found in sculpture, monumental works, and ornament generally. All this is to be traced to the tendency of artists to follow *objective* forms of thought in preference to that more scientific process which derives by pure reasoning the expression of our requirements. It will, however, be the case under the present copying system of the day, which gives to the mere travelled draughtsman, however incapable he may be to devise or think for himself, the foremost place in the ranks of the profession. It is, for instance, fashionable to be a follower of a Street or a Brooks, or some other noteworthy church architect who caters to the ritualism of the hour. But this is not art, it is slavery! An outsider, no less a man than Mr. Herbert Spencer, has noticed the tendency of modern ecclesiastical art to follow Puseyism in a recent number of the *Contemporary Review.* Secular architecture is in a much healthier state, although Mr. Seddon said at the Church Congress it was in a "slough of eclecticism." Architects not trammelled by precedent or antiquarianism boldly think out their requirements in houses, factories, hospitals, and the many other requirements of this commercial age, and although one may see at present nothing but a chaos of ideas, out of this chaos I believe will spring an architecture original in its adaptation to modern ideas and wants, and expressive of our materials as it will be independent of any foregone style and sentiment.

G. H. G.

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[*] See 'Churches for Congregations.'

PROFESSOR RUSKIN'S ART-SCHOOL AT OXFORD.

(By a Correspondent.)

Not more than fifteen years ago, in the course of conversation, a distinguished professor asserted that there were only *three* of the authorities of the University of Oxford who possessed any knowledge of Art. The professor who made this statement was an accredited authority, a devotee of Art, and, from his position and experience, fully qualified to arrive at his opinion. On Wednesday, in last week, one of the three authorities to whom he referred was re-nominated Vice-Chancellor of the University for the ensuing year. One of the first topics referred to in the review of academic events by the Vice-Chancellor upon resuming his duties, was the devotion by Professor Ruskin of time and money to the furtherance of Art studies. The prominence given to this fact might lead to a delusive belief that the University of Oxford has, at length, become conscious of its negligence, and is hastening to make amends. Unhappily, this is not the case. The general academic conditions of fifteen years hence, in regard to Art, have not been materially modified by any initiative action on the part of the authorities. They have accepted the Slade endowment of a professorship; they display a willingness to appreciate the efforts of their new Slade professor. Something more than this negative encouragement is demanded of them, and a golden opportunity which may be forthcoming must not be overlooked.

A room in the Taylor or University Galleries has been fitted up to form an Art School, wherein Professor Ruskin will, at his own cost, supplement the duties of his professorship by practical teaching. The fact of a portion of the Taylor Galleries being thus appropriated by no means implies that Art is about to gain an equal recognition at Oxford to that which Science, after many struggles, has won. The curators of the Taylor Galleries obtain a power and exercise it, without committing the University to any course they may pursue. The credit, therefore, as well as the support pertaining to the new movement, may only be limited, and require every possible encouragement. It may become the foundation of a great national school, doing more than the Royal Academy can possibly do in providing extraneous means of high culture and support for men of natural genius. How is this to be done? From the class of students who are now sent to the University, the new school will obtain no advantageous scholars. Those who are preparing for the Church will, for obvious reasons, limit their art culture to architecture. Those who are imbued with the prevailing prejudices of their father will reject painting and sculpture with similar vehemence to that brought to bear against Science. They will not perceive that Art is a vital element in the elevation and greatness of a nation, as well as a powerful auxiliary of the Church. The students of Law and Science and Medicine will not go into the Art School with any serious intention. Those of the higher class, without any special vocation, will, necessarily, be the chief recipients of its advantages. Out of these such men as the art interests of this country require will rarely, or never, come. It would be lamentable to waste the time of Professor Ruskin upon the speculative work of discovering genius among indiscriminate candidates, or to keep him engaged in the manipulative duties of a drawing or modelling master.

There is another course open. The new School may be filled with students who have acquired a certain proficiency in the local Schools of Art. This, to a certain extent, would be satisfactory, and the application of public money to such a purpose could be tolerated. But there is a far wider scope for good results which appears practicable.

In continuing his review of academic events on the occasion before noticed, the Vice-Chancellor referred to the increase, realised or imminent, of the various college revenues. These, he said, had invited a Royal Commission, whose report would, no doubt, raise many claimants for the diversion of such superfluous revenues to the foundation of new schools and colleges in other parts of England, Scotland, and Ireland. Now, to what more worthy national use can a portion of these superfluous revenues be applied than to that of endowing this Art School, and creating a certain number of open scholarships of sufficient money value to maintain students from any class in the kingdom possessing genius for Art? No more worthy purpose can be mentioned, nor one more in pursuance of the intentions of the founders of the colleges to provide for pressing national necessities. At the same time, such a scheme will probably be regarded with great jealousy at Oxford, unless public opinion is aroused to take the initiative in the matter.

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A small School is in course of erection adjoining and in connection with the Roman Catholic Church, Elm Grove, Brighton. It will be a plain building of stock bricks. The builders are Messrs. Cheesman & Co., of Brighton.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requesst that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

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TO AMERICAN AND BELGIAN SUBSCRIBERS.

In answer to numerous inquiries, the Publisher begs to state that subscribers in the United States can be supplied with the Building News, post free from this Office, for the sum of 17s. 4d. (4 dols. 16c., *gold*) per annum, and in Belgium for the sum of 21 francs, payable in advance.

The remittance should, in all cases, be made by International Post-office Order.

☞ American and Belgian Subscribers, *especially when renewing their subscriptions*, are *particularly requested* to advise the Publisher of the transmission of the Post-Office Order, and the exact amount for which it is made payable.

NOTICE.

The time for sending in the drawings for the Building News School Planning Competition is extended to the 30th of November, 1872. For particulars, see Building News, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

Received.—T. S. D.—C. L.—S. W., junr.—R. W.—K. & Co. —H. V. & L.—E. D.—Puzzled.—J. & Co.—Rev. W. R.— H. F. C.—C. B. A.—J. C.—E. W. G.—R. M. S.—J. N.— S. Brors.—C. & Sons.

J. M.—The drawing to hand.

J. B. W.—Drawings returned.

E. B.—Query not inserted because it was an advertisement, and we don't insert advertisements gratuitously.

Correspondence.

GREEK AND GOTHIC.

To the Editor of the Building News.

Sir,—"Another Protestant and Architect" "both by precept and example shows." He not only writes about economy of materials and constructive skill, but he puts them into practice. He has "Boswellian faith" in them. Hence brevity and extra-"ordinary logic" are among the chief characteristics of his letter in your issue of the 27th of September. The "logic" I may at least look at, if I cannot see through; for the brevity there may be a cause—

> Where others toil with philosophic force,
> His nimbler nonsense takes a shorter course.

He speaks of a "scarcity of cube-stone" as well as of economy of materials.

"Another Protestant and Architect" reminds me "that Mr. Hay's appreciation of the beautiful in Greek forms of art, and Mr. Petit's sentiments of the sublime, and Dr. Johnson's veneration for antiquity, are not conclusive evidence that human genius exhausted itself when it produced the Parthenon." I said, in one of my letters, that no prophet is accepted in his own country, and that, therefore, "Another Protestant and Architect" might care little for the opinion of the late Mr. Hay. The same exception cannot, however, be taken to the *Ecclesiologist*, a journal founded by the Cambridge Camden Society, and with the express object, if I mistake not, of aiding the revival of Gothic architecture. The *Ecclesiologist* said, while waging a controversy perhaps of greater importance than that in which "Another Protestant and Architect" and I are now engaged, that "Greek art was essentially original," and that "the Greeks created an architecture as nearly perfect in every way as the human intellect can conceive." I need not refer to "Mr. Petit's sentiments of the sublime," nor to the opinions of Mr. Smirke, Mr. Penrose, Mr. Lloyd, Mr. Fergusson ["the Greek temple, the most perfect work of men's hands"], Gibson, the sculptor ["if there are palaces in Heaven, they are of Greek architecture"], M. Beulè, of France, or Mr. Stephens of America, for, although "Another Protestant and Architect" says at one time, "nor have I any fear of an appeal to authorities," at another he sneers at what he elegantly phrases "a Boswellian faith" in them. But where, I would like to know, does "Another Protestant and Architect" find Dr. Johnson's veneration for antiquity brought forward as "conclusive evidence that human genius exhausted itself when it produced the Parthenon"? If he will read again—and attentively and honestly—he will find that this is what Dr. Johnson says—"Antiquity has, undoubtedly, votaries that reverence it not from reason but from prejudice; some seem to admire indiscriminately whatever has been long preserved; what mankind have long possessed they have often examined and compared, and if they persist to value the possession it is because frequent comparisons have confirmed opinion in its favour, and the reverence due to what has long subsisted is the consequence of acknowledged indubitable positions that what has been most considered, and what is most considered, is best understood." The endeavour either to refute this argument or to transmute it into "veneration for antiquity," may be an exercise for "Another Protestant and Architect's" "logic," ordinary or extraordinary. Whether I legitimately made it serve my purpose I leave to the judgment of your readers.

I am far from believing that "human genius exhausted itself when it produced the Parthenon." As "there is one glory of the sun, and another glory of the moon, and another glory of the stars—for one star differeth from another in glory," so, in like manner, there is genius and genius—genius differing in alike kind and degree. There may be genius in a Gothic cathedral, but it is very different from that in a Greek temple, as the idealistic beauty of a Greek Juno is very different from the realistic of the British women of the nineteenth century—

> . . . finer women, ripe and real,
> Than all the nonsense of their stone ideal.

If human genius had exhausted itself when it produced the Iliad, there would have been neither the Æneid nor the Paradise Lost, but the Iliad remains as unsurpassed as does the Parthenon.

"Another Protestant and Architect" is "tempted to show me that, apart from its sculpture and associations, there is very little poetry even in the Parthenon—if there be any, it is the poetry of mathematics, which he treats with due respect;" and he tells me that "the beautiful is infinite, and we have much more both of the poetry of Science and of Nature in Gothic architecture." He may be "tempted," but while he takes very good care not to fall into this sort of temptation, he is by no means so guarded against falling into inconsistency. He has at last discovered poetry in the Parthenon—the poetry of mathematics, and this poetry he professes to treat with due respect. Now, here's "the respect that makes calamity." In your issue of August 2, he says of this very subject of his poetry:—"I do not suppose that the subtle curves of the Parthenon, or the theories of beautiful proportions which critics at one time discovered, were ever calculated by the builders on mathematical or optical principles." I know not with what respect he *now* looks at the sculpture of the Parthenon, but in your issue of September 6 he says that "greater things have been done in sculpture than were by the Greeks." [The poetry of "associations" is a subject too great to be now entered upon.] True, "the beautiful is infinite," but, as I said of genius, there are kinds and degrees of the beautiful. The beauty of the rose is not the beauty of the thistle. If there be much more of the poetry of Nature in Gothic architecture, so much the worse for the architecture. Legitimate architecture is art—not imitative, like painting or sculpture, but creative—and with Nature has nothing to do. God created Nature, and in man, made in His own image, He created the faculty of creating art, and hence our association with architecture is not that of nature, but of humanity. It is more god-like to create than to copy; a work of greater genius to invent the Ionic volute than to imitate a strawberry-leaf. The poetry of Greek art is an expression from within, the poetry of Nature an impression from without. Such poetry of Nature as may be in the associating of the aspect of a Gothic nave or choir with that of groves or avenues of "high o'erarching trees" the Goths, if proud to claim are as free to keep. Of what is meant by "the poetry of Science" I require some explanation, more especially as the position of science in architecture seems to be somewhat differently estimated by Mr. Ruskin, when he says "There may be much science, together with the lower forms of art, but there is as yet no Fine Art."

"That the highest form of the beautiful and the sublime in architecture is to be found only in the rigid Doric of the Parthenon is the sublimest nonsense your pages can contain" says "Another Protestant and Architect." Now, this *ipse dixit* must be taken at only what it is worth. I have asked him "Will 'Another Protestant and Architect' just mention the Gothic building that is of equal or surpassing beauty to the Parthenon? Will he instance one of the host of Gothic churches or cathedrals—those things of comparatively yesterday—that he would submit to a criticism such as that which for centuries has been bestowed upon the great Greek temple?" He gave it as *his* opinion that greater things have been done in sculpture than were by the Greeks, and I have asked him to mention them—"If the Goths have produced a greater work than the frieze of the Parthenon, can he tell me its local habitation and its name?" He said that "even Mr. Thomson goes back for inspiration to the Egyptian;" I have denied it, and asked him to prove it. The sort of "logic" that I want is answers to these questions; the "conclusive evidence," proof.

"Another Protestant and Architect," however, ventures upon one "fact"—"it is a fact that for lofty buildings of many floors the style of the Parthenon has no capacity of development." This is much akin to his statement that in Greek churches the only thing likely to be worth looking at as a work of skill will be the roofs, and these cannot be seen for plaster. But it is a "fact" that there are in Glasgow several "lofty buildings of many floors" in the same style as the Parthenon, the Greek, just as in Glasgow there are Greek churches with exposed roofs, and one with no plaster in it whatever.

"Another Protestant and Architect" seems to have the gift of prophecy, and, naturally enough, to glory in it. He is at it again: "It is no hazardous prophecy that, with the present scarcity of marble and cube-stone labour and feuing areas the style of the Parthenon will ever become anything but a rarity." But the style of the Parthenon becoming a rarity is not the question at issue; it is, in architecture, is Greek the greatest achievement of genius? Nor will it do for "Another Protestant and Architect," after having said in his first letter—"after all, Mr. Gildard's ideal of a Presbyterian church seems to be that it should be 'comfortable,' in which we all agree, only many would have elegance and solemnity of grandeur as well"—now in his latest to throw over the constituents of "elegance and solemnity of grandeur" because that there is a present scarcity of marble and cube-stone, labour and feuing areas.

Besides the gift of prophecy "Another Protestant and Architect" has another most remarkable one, that of importing into this controversy matter wholly foreign to it. In one of his letters he imports "Italian," in another "the Classic arch," and in his latest "the Greco-Egyptian style"—which have about as much ado with a controversy between Gothic and Greek as would wine, cider, and absinthe in a dispute on the respective merits of beer and brandy. Among his pertinents to "the Greco-Egyptian style" are "solemn porticos" and "unnatural stiffness." "Another Protestant and Architect" has yet another gift, that of extra-"ordinary logic," and by this he may possibly show that the "solemn porticos" mentioned in one letter can conduce nothing to the "solemnity of grandeur" desiderated in another. He has as little faith in the unnatural stiffness of the "the Greco-Egyptian" as in "the rigid Doric of the Parthenon." "Unnatural stiffness" is as much out of place in this discussion as is "Greco-Egyptian," for we are considering architecture, which is not nature but art; if the Doric of the Parthenon be "rigid," if fulfils at least this condition, "constructive skill."

"Another Protestant and Architect" thinks that "you would not probably thank him for serving up any more 'cauld kail het again.'" After the manner of Mrs. Glasse, saying, "First catch your hare," I may remind him that when he makes "kail" again he should not forget the butcher's-meat. There seems with our friend to be a "present scarcity" of other things than cube-stone.

I know not if "Another Protestant and Architect" would have written what he has written if he had subscribed his name. When a man is led into the mire by some *ignis-fatuus* he endeavours to extricate himself by putting his best foot foremost. This, sinking for want of a firm foundation, he falls back upon the other, which, weaker, sinks farther, splashing more mud upon his face as he goes deeper into the ditch.

Although Professor Kerr advises "not to pay attention to the canons of Ruskin, or the class of amateur writers upon art, but to go for opinions to men who had passed their lives in the profession, whose experience was great, and who had obtained a position which nothing but a profound knowledge of, and attachment to, art could have given them," yet, as I have repeatedly referred to Mr. Petit, I will, business and other things permitting, read the books recommended, and I have no doubt I will enjoy the glowing pages of the eloquent editor of *Fors Clavigera.*—I am, &c.

Glasgow, October 10. THOMAS GILDARD.

MODERN CHURCH ARCHITECTURE.

SIR,—The speakers at the Church Congress were severe, and justly so, on modern church architecture. The blame, however, should not be entirely attributed to architects. Cantankerous and faint-hearted vestrymen and archæological parsons have too much to do with the details of church building to raise any hope of radical change, and to them in a great measure the inflictions which we have now to suffer should be attributed. At the same time it is the custom of most architects to reproduce in the most perfect manner those Mediæval buildings or collected parts of them which, according to their various notions, achieve the greatest architectural effects. As it is impossible to copy and amalgamate things artistic without losing their life and power, we are now in possession of hundreds of brand-new churches, which ape, but cannot equal, the rare qualities of ancient churches. Not only so: even the churches which architects copy are totally unfit for their purpose. They were never designed for the Protestant forms of religion, and can never be properly fitted to it. Had the same spirit which gave rise to Gothic architecture survived the Reformation, we should doubtless have had fitting and worthy precedents. But to make up for that loss there is now a growing tendency among Ritualistic clergymen and young ladies to fit the religion to the church, and thus to make up in parade, millinery, and music, what they lack in spoken sentiment.

For those results, so far as new churches are concerned, architects will have to answer not a little. The reason of all this is obvious—there is no difference between a Roman Catholic and a Protestant church; yet the ritual, the forms, and the sentiment are (or ought to be) entirely dissimilar. The consequence is that the wants and fitness of the church have been swamped in that blind infatuation for copyism of inappropriate features with which modern architects are led. Not only so, they are Conservative in all things to the very core. A more Conservative class of professional men cannot be found. As a rule, they are perfectly content with that kind of church with which the people have made shift for ages past. That same spirit of intense reverence which prompts the architect to a worthy and hallowed reparation of the ancient church is only too forcibly impressed upon the copied new. Although they do venture on fantastic license in some secular buildings—simply for the want of precedents—they never can feel justified in departing from the time-honoured arrangements and sacred associations of the Church. These are the besetting sins of the day, and, as Mr. Seddon very truly says, are more honoured in the breach than in the observance; and until our architects are imbued with other schools of thought, feeling, and sentiment, there can be no prospect of a thorough and improved change in this, the chiefest phase of the art and science of the profession.

The remedies which were suggested at the Congress were simply patches and makeshifts for the occasion. The root of the matter lay entombed. The plan of the Greek Cross which Mr. Seddon has adopted is worthy of all praise as an improvement upon the "long drawn aisles." That plan, however, simply reduces the defects of the stereotyped arrangement to a minimum; it does not remove the inherent defect to which that system is subject, and in both that and the broad nave and narrow aisle plan the acoustic properties of the buildings will not be satisfactory. But the proposal of Mr. Beresford Hope that we should reproduce our minsters is simply absurd; for the purposes of worship they possess no advantage over the simple parish church, but all their defects are intensified by their bulk. It is positively painful to attend Westminster Abbey or any of our cathedrals with the object of hearing the sermon without sitting under the eyes of the preacher, and in respect of hearing, the mass of the people would be better circumstanced near the roof than on the floor, for as the sound naturally rises, it is lost amid the "storied windows richly dight." The big columns, the complicated roof, the odd corners, and oblong proportions, prevent the free passage of sound and obstruct the view of altar and pulpit. Moreover, the very style which is in fashion is necessarily expensive. If we make comparisons between the cost of town halls and churches of equal capacity, it will be found greatly in favour of the former. While we may build a simple hall in an artistic style at £3 per head, we cannot build the stereotyped church for less than £5, sometimes £15, per head. This ought not to be, and I can attribute it only to the style of arrangement. For its artistic effect, which is great, it is possible to have too much of a good thing, and people are becoming surfeited even with the greatest of modern achievements. Their beauty is not sufficient to outweigh their unfitness.

The question then comes, what is it we want? The answer is plain enough, we want a simple room or hall, call it a church if you like, in which all people, rich and poor, shall mingle on a footing of equality, to worship before God, and where all can hear and see the full measure of the service and ritual that appertains thereto. We possess a model in some of our London theatres, not exactly as they stand, for there is something repulsive in the word to our sacred feelings. Nor are the style or decorations fit for worship, but we want the genus architect who shall impart to an arrangement not entirely dissimilar to the theatre that idea of solemnity and awe which happily is characteristic of our churches, Nothing on earth is so inspiring as to be surrounded with a vast phalanx of humanity impressed with the presence of deity. We want large churches, where all can hear and see in comfort, and until a radical change takes place in the ideas of architects, they will not be in possession of the key-note of success in church architecture.—I am, &c., H.

PROFESSIONAL CUSTOM AND CLIENTS' LAW.

SIR,—"Custom," says the time-honoured proverb, "governs the law;" and the saying is something more than a popular utterance: it is adopted as a principle of equity by even the judges of the land, wherever they can discern a well substantiated custom, and no *lex scripta* to the contrary is forthcoming to upset it. Whenever architects go to law with their clients, they usually enjoy the advantage of this leaning of the judicial mind towards the maxim, inculcated in the proverb "*Mos legem regit*"—the motto, by-the-bye, of a well-known Staffordshire baronet, whose surname* is made up of its first five letters. But architects' clients, judging from recent cases that have cropped up of late, would seem to ignore professional custom altogether; and as architects, despite of all Conduit-street has to say to the reverse, are a most discordant fraternity, clients have it pretty much their own way.

Architectural practice is now-a-days regulated, not by architects, for these can't agree about it, but by the public, who employ them, and who *do* agree about it. In your own capacity as a professional journalist, it is your special province to let your readers, chiefly architects, know from time to time what it is the public decree. The latest decree "out" is this. No architect shall compete for any one structure with more than one design. There is the case of Mr. E. W. Godwin (see correspondence in last week's BUILDING NEWS), and the recent case of Sir Gilbert Scott, at Edinburgh, in proof of what is the public mind on that question. Let architects beware in time; and if they cannot, or will not, in their collective body (wherever that may be) set aside this public dictum, take care that they don't compete with more than one design for any public edifice. If they do, they may have to share the fate of Sir Gilbert Scott and Mr. E. W. Godwin.

Never before in my long experience of the ethics of architectural competition has such a rule as this been heard of. Cases of architects competing with more than one design are "plenty as blackberries.' I will mention a few that at once occur to me; and the memory of your readers will easily supply others. Mr. Allom, for example, gained the second premium for the Manchester Assize Courts with one of two designs he sent in for that structure; Mr. Garling, in the limited competition for the Courts of Justice, sent in two designs; the architects of the Bradford Town Hall gained the competition with one of two designs, the committee remaining, I believe, in doubt even after adjudication which of the two they should ultimately determine to execute; in the great barrrack competition a more remarkable instance occurred: a firm of architects submitted three separate designs, and to all three designs, her Majesty's Government awarded three separate premiums, although it was an immense competition, and there were but six premiums to divide amongst the competitors.

So much for professional custom. If we turn to the utterances of architects on this point, we shall see how novel is the present view of it taken by clients. In the BUILDING NEWS this year you called attention to the code of regulations for architectural competition issued by the Architectural Association. It opens with an express provision on this very point raised by Mr. Holloway, to this effect:—"Each architect is to be at liberty to compete with one or more designs as he may think fit: but each design shall consist of no more than the following drawings," &c., &c. So said the Architectural Association nearly a quarter of a century ago. What say the recent regulations of the General Conference of Architects? I have them not at my elbow to quote. If they are silent on so vital a point it has been a great oversight, which, in the interest of the profession, ought at once to be rectified. It is surely bad enough to get up one design for one premium; to prepare two, or perhaps more, is enough to exhaust the patience and time-honoured forbearance of even a competing architect.—I am, &c., S. S.

MR. HOLLOWAY'S COMPETITION.

SIR,—Referring to the edifying correspondence which you published in your last issue, I should be glad to be permitted to say that in my opinion there was nothing in the conditions to limit Mr. Godwin, or myself, or any other person, from sending in more designs than one, and that the premiums were offered for the best "designs." Morally, therefore, Mr. Holloway, as he does not call in question the authenticity of the design, has no ground for declining to pay the premium, though Mr. Godwin, by the unfortunate "negligence of his clerk," and the very remarkable circumstance of his not knowing when he was advertised for, has fairly given ground for Mr. Holloway to require the authorship of the design to be established in some special way. That gentleman, however, has taken an utterly indefensible ground, and the reference to his solicitor is the greater insult as he has taken care in his conditions to keep everything in his own hands. Legally, I apprehend no one of us could have recovered anything, even if the whole Institute of Architects had reported in his favour. But the moral claim is another question; and to ask the President and Mr. Wyatt for advice, and print it and then not follow it, is conduct which I refrain from characterising.—I am, &c.,

A COMPETITOR.

THE OXFORD SEWAGE SCHEME.

SIR,—In reading a day or two since in your paper of Sept. 27th an article on the utilisation of sewage at Leeds by the A B C process, I noticed a parenthetical reference to the sewerage scheme adopted by the Oxford Local Board in 1871 which caused me some little surprise. The writer is mistaken on two points. In the first place, the then proposed pumping station in the Iffley Meadows is not near a residential locality, although near the boating reaches of the river; and, secondly, it was never intended to erect works on the principle described by your correspondent; therefore, the Board was not in danger of committing the grave error he deprecates.—I am, &c.,

WM. HY. WHITE,
Surveyor to the Oxford Local Board.

Oxford, October 10.

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STAINED GLASS.

POLESWORTH. — A memorial window has been erected in Polesworth Church, near Tamworth, to a lately deceased bellringer. At the top part is a representation of the old church spire of Polesworth, with a figure of a bellringer. Below are a woman and two children entering the church. Underneath is the inscription "Venite Adoremus."

ADBASTON.—A memorial window is being erected by Messrs. Ward & Hughes, of London, in the parish church of Adbaston, Staffordshire. In the centre light is a representation of "Our Lord on the Lake of Tiberias" and the side lights are filled with scenes of the "Resurrection" and "The Raising of Lazarus."

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ROCHESTER SCHOOL BOARD.—At a meeting of this Board, on Thursday week, the clerk laid before the meeting a letter from the Education Department, approving of the plans for the new board schools to be erected in John-street, Troy Town, and recommending that application should be made to the Public Works Loan Commissioners for the terms on which they would advance the Board the sum of £3,000, payment of which would extend over fifty years, with which to erect the proposed new schools, the Education Department sanctioning the borrowing of that amount. Mr. J. G. Naylar having signed the contract for the erection of the new schools in six months from the present time, the seal of the Board was affixed to the same, and the works will be commenced forthwith. The Chairman said it would be necessary to appoint a building committee of the Board to confer with the architect on matters of detail, and he would therefore suggest that the committee be nominated at the next meeting. This course was agreed to.

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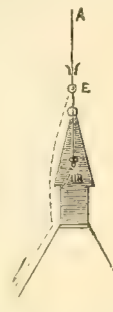
* Mosley.

Intercommunication.

QUESTIONS.

[2672.]—**The Drainage Act.**—I should be glad of any information respecting the adoption and working of the Drainage Act in localities where the same has been put in force, also the probable cost, &c.—Rusticus, Cumberland.

[2672.] —**Sash Pulleys.**—Is there any rule by which is determined the size of a sash pulley and line, either with reference to the weight of the sash or the thickness of the pulley stile? These pulleys are frequently, nay, generally, put in too small, and the line is consequently cut and frayed away very rapidly.—R. L.



[2673.]—**Lightning Conductors.**—I have fixed one of Spratt's flexible copper band lightning conductors to a school building by iron brackets and glass insulators, but in consequence of the flexibility of the band and the temporary character of the fixing by glass insulators, it is in danger of being removed by the boys. Should I be endangering the building by confining the band to the wall at intervals of (say) 18in. by copper or iron staples? Would any other material be preferable for these staples? May the band itself touch the wall, or slate or zinc covering? Referring to sketch, would it be necessary to carry the conductor above the point E if two connections are made with the terminal, one at B (woodwork), or bottom, and the other at E? I should feel greatly obliged if any correspondent acquainted with the subject would kindly give information thereon through the "Intercommunication" column.—A. R.

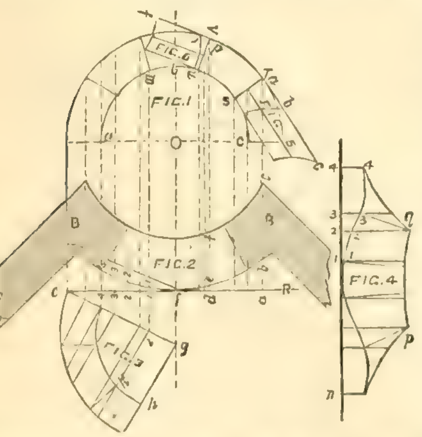
[2674.]—**Ormean Park, Belfast.**—Can any reader of the Building News state what is being done in reference to the above competition, plans having been lodged three months ago? No acknowledgment in any shape has been made as to the receipt of plans.—Competitor.

REPLIES.

[2656.]—**Puzzolana.**—Your correspondent "M." seems to think that puzzolana is another name for an hydraulic mortar, whereas it is only one of the two ingredients that goes to make up an hydraulic mortar. If "M." will refer to my answer he will find that I said nothing about powdered brick and tile dust forming an hydraulic mortar.—J. T. J.

[2665.]—**Measuring Chimney Stacks.**—Chimney stacks are generally measured by the yard superficial, girth by height; small chimney stacks by rising foot. What is your agreement? If none, make it understood first. There is no universal measurement, different counties having different customs.—R. C.

[2669.]—**Circle upon Circle.**—Fig. 1 is elevation of arch. Divide the intrados of the arch into five equal parts, as shown by *a b c*, and draw lines from the centre showing the radiating joints. Fig. 2 is the plan. B B are the piers, &c. Draw the line *e f* parallel to *a c* (Fig. 1), and draw the dotted lines as shown perpendicular to *e f*, and continue them to *e g* (Fig. 3). Set up the ordinates as shown, and make *g h* equal to *o b* (Fig. 1), and *i k* equal to *l m* (Fig. 1), and so on with the others, and then bend a thin piece of wood around to those marks obtained, you will have the face of the arch one-half of the width obtained. Fig. 4 is the soffit of arch. Set out the stretch out of arch Fig. 1, as shown by *a b c*, on the line 4 *n* (Fig. 4), and set up



the ordinates perpendicular to 4 *n*, and make 1 1 equal to 1 1 (Fig. 2), and 2 2 equal to 2 2 (Fig. 2), and continue until all is done. Transfer them on the other half on line 4 *n*. The points being obtained, bend a thin piece of wood around, you will then have the required curve. Divide the line *p q* into three equal parts, which will give the size of stones in soffit. Draw the tangent *f* R (Fig. 2), and draw the dotted lines perpendicular to *f* R, and where they meet S T and *u v* draw the lines perpendicular to S T and *u v*, and make *a b c* (Fig. 2) equal to *a b c* (Fig. 5), &c., which will give the top bed of first stone and bottom bed of second stone. Make *d e f* (Fig. 2) equal to *d e f* (Fig. 6), &c., and this will give the top bed of second stone and one bed of the key stone, which will be all that is required.—T. W. J.

[2671.]—**Party Walls.**—If "Subscriber's" house or party wall is built exactly up to the extreme boundary of his ground, then his neighbour or conterminous proprietor can build close up to "Subscriber's" wall; and if he builds a brick on edge wall, he, of course, gets the benefit of leaning against "Subscriber's" wall, and "Subscriber" cannot prevent him so doing. I was some time ago witness in an action for damages arising out of a case every way similar. The defender, who had built a brick wall 4½in. thick against the pursuer's gable, won his case, and was allowed expenses.—Tom Pinch.

[2671.]—**Party Walls.**—Party walls literally mean the division walls between two proprietors, and should in all cases be made substantial, both for supporting the respective party's timbers, &c., and also for keeping any sound from passing, and should really be the joint property of each, and set on their respective lands. The party who builds first, or even rises his house above his neighbour's, pays the first cost in full, charging his neighbour half value for what portion he really wishes to have the use of. Boundary walls are usually taken at 6ft. high. If the wall and the land on which it stands belongs in fee simple to A, it will be at his option whether he allows B to make any use whatever of his wall; A, however, must not allow any part of his wall or roof to project beyond his own limit. B, in this case, desiring to become joint proprietor of the said wall, must submit to pay half-value of the wall and the land on which it stands; and this is precisely what "Subscriber" should offer to his neighbour. A brick on edge (noggin) is of no use for a party wall. They should never be less than 9in. It will be to your neighbour's loss if he builds a wall insufficient to stand. If you are under any Local Board or other authorities, they should see after the strength of the walls.—Rusticus, Cumberland.

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WATER SUPPLY AND SANITARY MATTERS.

Bombay.—A report on the water supply of Bombay has just been published by Major Hector Tulloch, R.E., Executive Engineer to the justice of that city. He reviews therein the various schemes propounded by Messrs. Walton, Aitken, and others, and recommends the Tansa Valley as the source most likely to yield a sufficient and lasting supply, or, if the expense be deemed too great, the adoption of the Kennery and Toolsee projects.

Chelsea.—Mr. Pattison, the surveyor to the Chelsea Vestry, has submitted a list of streets in the parish where pipe sewers are laid down, and also the cost of replacing them with brick sewers. The following is the list:—Limerston-street, £720; Victoria-grove, £600 10s.; Camera-square, £692 15s. 6d.; Radnor-street, £510 5s.; Shawfield-street, £540 6s.; Manor-street, £1,563 14s.; Godfrey-street, £621 7s.; Arthur-street, £240 10s.; College-street, £350 16s.; Cadogan-place (north end), £720 4s.; Wellington-street, £520 16s.; Collingwood-street, £220 6s.; Upper Manor-street, £529 9s., being a total of £8,531 8s. 6d. The Vestry contemplate a loan of £10,000 to carry out these sewer works.

The Windsor Castle Drainage.—The works for the drainage of Windsor Castle and Frogmore House are rapidly approaching completion. At Old Windsor the Thames Conservators are erecting a new bridge over the navigation cut between the pumping station and the Ham, upon which the sewage farm is situated. The bridge will be of iron girders, supported upon buttresses of red brick, concrete, and stone. The pipes conveying the sewage from the station to the farm will be carried over the water on the bridge to the Ham bank, whence the liquid will be distributed over the field. The buttresses of the bridge are nearly finished, and the iron work will soon be placed in position. The pumping station is in a forward condition, while a number of soldiers from the Windsor garrison are engaged upon the earthwork of the irrigation field. The whole of the works must be finished before the return of her Majesty to Windsor in November.

Whitchurch.—An outbreak of typhoid fever has recently occurred at Whitchurch. The sanitary condition of the place seems to be most unfavourable. In a porous soil, the water-level of which was soon reached, were an abundance of shallow wells, with numerous holes, dug throughout the place for the reception of refuse and filth. The refuse-holes were no sooner filled than they were dry again. The dumb wells allow all but their more solid contents to soak away unseen, and often unsuspected, and the privy pits do not often require emptying on account of the facility with which liquid contents disappear. The wells are notably fouled. There is no proper system of drainage, and much of the town has no artificial drainings whatever; and hence the liquid filth and slops either trickle from one premises to another at a lower level, and so on to the streets, or else they are absorbed by the porous soil.

Our Office Table.

American Skilled Workmen and the Vienna Exhibition.—The announcement is made from Washington that the President intends appointing a deputation of skilled working men, to be designated by various trade organisations in the United States, for the purpose of visiting the forthcoming Vienna Exposition, and reporting for the benefit of their countrymen upon the progress of the industrial arts in Europe. In his Message to Congress in December, authority is to be asked for this, with a provision to defray the expenses of the deputation.

The Architectural Association of Ireland.—This Association, which we greet with satisfaction, has just commenced its existence. May it have a long, a laborious, a useful, and a happy life. It appears to be modelled somewhat after the London Architectural Association, and judging from the names of the architects who appeared at the opening meeting, and the address of its first president, portions of which we give elsewhere, the new society has a good prospect before it. Again we most heartily wish it success.

New Bridge at Peckham.—On Thursday week the memorial stone of the new Globe Bridge over the Surrey Canal, Peckham, was laid by Mr. E. Dresser Rogers. The bridge will be one of a series built to replace the old and inconvenient structures, and has been designed by Mr. Dredge, Assoc. Inst. C.E. The contractor is Mr. Peach, and Mr. Head supplies the iron. The bridge will have 22ft. 4in. of waterway, with a towing-path 5ft. wide. The roadway will be 40ft. wide, including two footways of 6ft. wide each.

Testimonial to a Brickfield Reformer.—It will be recollected that the recent legislation which has so much ameliorated the condition of the children of the brickfields of Leicestershire and other parts of England is largely due to the energy of Mr. George Smith, of Coalville, who has expended much time, pains, and money on his task. It is now proposed to raise a testimonial to Mr. Smith. A committee has been formed for that purpose, and nearly a hundred pounds have been already collected by private exertions. Mr. T. Tertius Paget, of Humberstone, Leicester, is the treasurer to the fund.

The Albert Memorial Chapel, Windsor Castle.—On Thursday week a number of wooden cases, containing portions of the sarcophagus which is to adorn the interior of the Albert Memorial Chapel, arrived at Windsor Castle from the atelier of Baron Triqueti at Paris. These marbles were immediately upon their arrival deposited in the Albert Memorial Chapel, where the sarcophagus will be erected upon the floor of the interior, at the east end. An effigy of the late Prince Consort will surmount the sarcophagus. Baron Triqueti, who is not very well, is in Paris.

The Edinburgh Cathedral Designs.—We understand (says the *Edinburgh Courant*) that, in consequence of the great interest which has been manifested in the designs for S. Mary's Cathedral, Edinburgh, and of so many citizens of position and influence having been out of town during the period of their exhibition, the trustees have it in contemplation to re-exhibit them to the public for a fortnight or three weeks some time next month.

A Borough Surveyor's Salary.—At the last meeting of the Newbury Council, the Finance Committee reported against increasing the surveyor's salary, which had been previously fixed at £50 a year. The surveyor asserted that if the salary was fixed in proportion to the sums paid by other towns he should receive £100 per annum. A member of the committee stated he was convinced that £50 a year, including the Town Council work, was just and fair as between the town and the surveyor. The late surveyor performed the duties of the office for £35 a year, and during that time superintended the drainage works. With respect to the towns quoted by the surveyor, he found that the salary paid at Colchester was at the rate of £7 10s. per thousand of the inhabitants; Chelmsford, £8; Enfield, £8; Guildford, £7; Hastings, £7 10s.; Luton, £6; Maidstone, £5 10s.; Oxford, £9 10s.; Rugby, £8 10s.; Reading, £6 10s.; New Swindon, £8; Tiverton, £7; Weymouth, £8; Winchester, £8 10s. As the salary now proposed for Newbury was at the rate of £8 per thousand inhabitants, it would be seen that it was a fair average as compared with other towns. In addition to the £50 a year, the surveyor would have £10 as inspector of nuisances. It was ultimately agreed that the present salary of £50 per annum should be continued, but that the surveyor should be expected to do the Town Council work.

S. Paul's Churchyard.—A long talked of improvement is about to be made in the western portion of S. Paul's Churchyard. The dwarf wall of stone which now surrounds the Cathedral facing Ludgate-hill, with the solid iron railings with which it is crowned, will be removed as far as the north-west and south-east corners of the fabric itself, and the entire area or courtyard, in the centre of which stands the statue of Queen Anne, will be thrown open to the bottom of the steps which lead up to the great western door.

Railway Tunnels at Baltimore, U.S.—There are in course of construction two tunnels beneath the city of Baltimore. That of the Baltimore and Potomac Railroad Company will be about 1½ mile long; the other, by the Union Railroad Company, has for its object the connection of all the roads with tide-water, and also to afford a passage around the city by steam-power. The Union tunnel is being constructed under the bed of Hoffman-street, which runs east and west. From façade to façade it is 3,400ft. long. It is formed of a semicircular arch of five brick rings, and an invert of four bricks. In some places, where a good rock bottom exists, the invert is dispensed with. About 450 men and 90 horses are engaged on the work. The material, which is mostly sand, is excavated to the whole depth of the cut; the arch is then built and the material replaced over it. The tunnel, with the exception of about 360ft. which is being drifted, is worked in this way. The whole tunnel is expected to be finished and ready for trains by next January. The arch is being built in sections of 50ft. in length, and these sections are being constructed at five or six points simultaneously.

New South American Railway.—The plans of the new Rosario Railway have been deposited with the Government of Buenos Ayres. The engineering staff comprises Messrs J. Wolffe Barry, John Robinson, A. Le Bertram, Montague Rich, Malcolm Graham, John C. Allen, Robert Hogar, Peter Shortreede, and a French engineer. The main line will pass close to Capilla Senor and through San Nicolas, throwing out branches along the route to the ports of Zarate, Baradero and San Pedro on the Parana: The concession further obliges the projector to make a branch line from Capilla Senor to Giles, Carmen de Areco, Salto and Rojas, besides cross-lines to connect Pergamino with San Nicolas; and Arrecifes and Pergamino with San Pedro. The whole Billinghurst concession will comprise about 500 miles, and cost probably 3 millions sterling. The main line is 190 miles long. This line will place Rosario by express train within 5½ hours of Buenos Ayres. There will be two underground viaducts, one at Almagro, passing under the Western Railway: another at the barranca of Rosario, passing under the Central Argentine to the water-side.

Used Up.—A correspondent of the *Lumberman's Gazette* writes:—"I have not the least hesitancy in asserting that there are still standing in the forests of Michigan over forty billion feet of merchantable pine. But such is now the mill capacity in Michigan, and the determination to work it, that in the present year one-eighth will be consumed of all the pine standing in the beginning of 1872, and the same fate will avail for 1873, and so on. Thus the pine forest will be swept away in eight years, even if the woodman's axe is not aided by the destroying flame."

The Slade Professor of Fine Art.—The Slade Professor of Fine Art (Mr. John Ruskin, M.A.) will deliver a course of lectures on "Sandro Botticelli and the Florentine Schools of Engraving," on Thursdays and Saturdays, commencing the first week in November, at the Lecture-room in the Taylor Buildings. The course will consist of only six lectures, but each lecture will be given twice; on Thursday (in each week) to members of the University exclusively; on Saturday to a general audience, as appointed by the founder of the lectureship.

Glasgow Institute of Architects (Incorporated).—The fifth annual general meeting of this Institute was held in the registered office, 157, S. Vincent-street, on Tuesday. The chair was occupied by Mr. Alexander Thomson, the president, and there was a good attendance of members. Mr. William MacLean, the secretary, read the annual report of the council and abstract of the treasurer's account, which showed the affairs of the Institute to be in a satisfactory position. The report and statement were unanimously adopted and approved of, and directed to be printed and circulated among the members. The following gentlemen were then elected to be members of council for the ensuing year:—Messrs. John Baird, George Bell, John Burnet, Campbell Douglas, John Gordon, John Honeyman, James Salmon, Alexander Thomson, Alexander G. Thomson, and David Thomson. The meeting then separated.—A meeting of the newly elected council was held immediately afterwards, when the following office-bearers for the ensuing year were elected:—President, Mr. George Bell; Vice-President, Mr. John Baird; Treasurer, Mr. Alexander G. Thomson; Secretary, Mr. Wm. MacLean; Auditor of Professional Accounts, Mr. James Salmon.

Art Exhibition at Brighton.—During this and last week an exhibition of fine art and curiosities has been held in Brighton, to inaugurate the assignment of the new parish of S. John the Evangelist to the Rev. A. A. Morgan, M.A., who for eleven years has been incumbent. The whole proceeds will be devoted to the intellectual benefit and entertainment of the poorer classes of the district, after the example of the exhibitions for the poor at Bethnal Green. The object, therefore, is truly a benevolent one, at the same time affording the very poorest an opportunity of seeing works of art and articles of *vertu*.

A Unique Organ.—The new organ which has lately been opened at Yaxley Church, Suffolk, has been designed on the same principle as, and is in several particulars a reproduction of, the organ, believed to be unique, at Old Radnor, South Wales, the case of which belongs to the year 1523, or thereabouts. Both instruments are small chancel organs, in oak cases, carved and panelled; both are placed at the east end of the choir seats on the north side, and are designed so as not to intercept from the congregation a view of the altar. The dimensions are nearly the same. The total height of the Radnor organ is 18ft.; of the Yaxley organ, 18ft. 2in.; width above the windchest, Radnor organ, 9ft. 4in; Yaxley, 8ft. 10in.; height up to the brackets is the same in both, 5ft. 10in.; projection from the wall, Radnor organ, 2ft. 6in.; Yaxley, 3ft.; the Yaxley organ having eight drawstops, while Radnor has only five, with the bellows laid in the chancel aisle, which in the Yaxley organ are ingeniously placed above the head of the organist. The cost of the Yaxley organ was only £190.

CHIPS.

An additional reservoir, built at the top of Warberry Hill, Torquay, capable of holding two-and-a-quarter millions gallons of water, was opened on Saturday week.

At the meeting of the Marylebone Vestry on the 10th inst., Mr. Charles Carr was unanimously elected to represent the parish on the Metropolitan Board of Works, in the place of Mr. A. N. Shaw, deceased.

Bishopsgate-street is being repaved with asphalte.

Mr. Thomas Landseer has just completed the etching of Sir Edwin Landseer's well-known picture, entitled "Browsing." The health of Sir Edwin continues to improve, and is already such as to admit of his personal attention to business.

Last week some more remains were discovered in the church of S. Michael, Sittingbourne. A niche which existed in the wall on the south side of the church, near the principal entrance, was found, on the removal of the plaster from the walls, to be a receptacle for holy water; it is in a very good state of preservation. A few remains of antique alabaster tablets and an ancient piscina have also been brought to light.

A new church was consecrated at Didmarton on Tuesday week. The cost has been about £2,100. Mr. Wyatt was the architect, and Mr. Brown, of Tetbury, the builder.

The finances of the Fulham Board of Works are at present in an awkward condition. The annual instalments on loans and other large payments are becoming due, and the Board are without funds to meet them, though they have already borrowed £2,000 of the London and County Bank, who are their bankers. This difficulty has arisen by the backward payments of the Fulham parish. The Board have resolved to apply for summonses against the parish officers.

Mr. Avery has been appointed to act as Deputy Surveyor to the Hornsey Local Board, during the absence, from ill health, of the surveyor.

The North Metropolitan Tramways Company have commenced the construction of a new line from Mile-end to Clapton, which will pass along the Cambridge-road, Mare-street, Hackney, Lower and Upper Clapton-roads to Stamford-hill, forming junctions at the Hackney-road with the lines from the latter place to Shoreditch Church, which have already been made.

The memorial-stone of a master's house for the accommodation of 40 pupils was laid on Friday afternoon at the Royal Medical Benevolent College, Epsom. The building is designed by Mr. George Elkington, F.R.I.B.A., of Cannon-street, the college architect, Mr. Shepherd, of Bermondsey, being the contractor.

It has been resolved to erect a magnificent Episcopal Cathedral in New York, at a cost of 2,000,000 dollars.

The London Architectural Association will commence the educational labours and amusements of the session for 1872-73, by a *conversazione*, at Conduit-street, on Friday evening, Oct. 25.

The Brighton School Board have passed a resolution to convert their premises in Circus-street into a ragged school.

Tenders are required for the construction of a new groyne, to be built of wood, in front of the Brighton Aquarium sea wall. The drawings are to be seen at the office of the Borough Surveyor, Town Hall, Brighton. Tenders to be sent in before 10 a.m., Friday, Oct. 25, addressed to the Works Committee.

No 62, Marine Parade, Brighton, is undergoing extensive alterations, from the designs of Messrs. Driver & Rew, architects, of Westminster Chambers, the builder being Mr. Lockyer, of Brighton.

Are tramways rateable? The decision to be given shortly by the Court of Queen's Bench to this important question will affect the parochial purse one way or the other very considerably; and in the event of a decision hostile to the interests of the company, the pockets of the tram-car-riding public must also be sensibly affected.

A Fine Art Exhibition was opened at Kirkaldy on Tuesday. Nearly 200 paintings by artists of local and national fame are exhibited.

The parish church of Gartmore, N.B., was reopened on Sunday last, after restoration. A new vestry has been erected and a belfry—the bell having been previously rung from an old tree adjacent to the church.

Maryport New Docks, which have been so long in contemplation, are again likely to fall to the ground, through the trustees not being unanimous on the site, and the "borrowing powers," likely to be £30,000 short, of what was at first estimated by the engineer (Mr. Hawkshaw).

The memorial stone of a new school in connection with Muff Field Chapel, Bowling Old-lane, Bradford, was laid on Saturday. The school will measure 54ft. by 33ft., will accommodate 350 Sunday scholars, and will cost £800.

Westgate Chapel, Bradford, was reopened on Sunday, after cleaning and painting. The cost was £300.

The tender of Mr. David Miles, of Newport, (Mon.) for the erection of new Schools for the Newport School Board for £1,400, was accepted on Monday.

S. Peter's Dundisbourne Abbotts Church, Cirencester, has been reopened after restoration, under the superintendence of Messrs. Wallis & Son, of Gloucester. The total cost has been about £1,000. The works have been executed by Mr. Estcourt, of Gloucester.

A small (Roman) Catholic Church has been opened at Coniston. It was erected from the designs of Mr. James O'Byrne, of Liverpool. The style is Early English, and the masonry is of the local slate-stone. The roof, which is much exposed, is of framed spars. The length of the church and sanctuary is 80ft., the width 22ft., and the height 50ft. The contractor for the masonry was Mr. George Usher, and for the carpentry Mr. Edward Coward, of Coniston.

The Church of Sawbridgeworth, Essex, has been reopened, after restoration. Among other improvements, the font, which is supposed to date from the time of Edward III., and which was a heap of fragments, has been restored. The chancel has been repaired by the Ecclesiastical Commissioners, under the direction of Mr. Christian. Mr. John Egan, of Buckhurst Hill, was the builder.

The Mikado of Japan last week opened the railway from Yokohama to Yeddo.

The foundation stone of a new Cottage Hospital has been laid at Wisbech. The building will be of white brick, with stone dressings, Gothic in style, and will cost £3,000. Messrs. Adams & Son, of Wisbech, are the architects, and Messrs. Challans, of Grantham, the builders.

Mr. J. W. Ellis, of the firm of Gadsden, Ellis & Winterflood, surveyors and land agents, has been elected an Alderman of the City of London. Mr. Ellis was articled to Messrs. Musgrove & Gadsden, of Old Broad-street, in 1844, and in 1854 he became a partner in the firm. The range of buildings extending from 18, Old Broad-street to Threadneedle-street was planned and executed by him.

The Junior Army and Navy Club have taken the premises lately occupied by the European Assurance Company, for the erection of a new club on the site.

Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

Trade News.

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WAGES MOVEMENT.

LONDON.—The final meeting of the carpenters' and joiners' delegation was held on Saturday last. Mr. T. Davis, the chairman, said that since the last meeting the strike at Corbett & M'Clymont's, at Brompton, had been satisfactorily closed, and there were no disputes existing with any other firm. It must not be supposed, however, that the carpenters and joiners of London had any intention of giving up their claim for the full terms of their memorial—viz., nine hours per day at 9d. per hour—and the opinion of the delegates would be asked as to the propriety of appointing a watch or vigilance committee, with power of calling together a fresh delegation in support of the "nine hours and 9d." Mr. Cayrir then moved: "That a committee of nine delegates be now appointed to watch over the interests of the trade, to see that the terms of the late agreement are not violated by the employers, and to have power to call a delegate meeting whenever they see a favourable opportunity for promoting the terms of our original memorial for fifty-one hours per week at 9d. per hour. The duties of such committee to be performed without payment." Mr. Whaley seconded the resolution, which was agreed to. The following delegates were then elected on the Watch Committee:—Messrs. Davis, Matkin, Adams, Whaley, Kennedy, Cook, Barry, Cayrir, and Wright. The secretary stated that the balance-sheet of the late movement would be ready for delivery by Saturday next. The chairman then declared the existing delegation to be dissolved.

SHEFFIELD.—We hear that the building trade is stagnant in Sheffield, in consequence of the advance in the price of material. Bricks have advanced 5s. per thousand.

WISHAW.—The quarrymen's strike, which has continued for upwards of two months, may now be considered at an end, the men having during the past week been gradually resuming work on the employers' terms.

TENDERS.

ACTON.—For laying a pipe-sewer for the Acton Local Board:—

Stiggs	£177	0	0
Nave	141	5	0
Ellicott	136	0	0
Hubbard	133	5	0
Godair	128	12	0
Pizzey	124	0	0

BRIGHTON.—For making and fixing new book-cases at the Free Library and Museum, Brighton. Mr. P. C. Lockwood, C.E., architect:—

Garbutt	£365
Drew	353
Brown	312
Cheesman & Co. (accepted)	235

CHELSEA.—For new infirmary at Chelsea, for the Guardians of the Chelsea Union:—

Thorn (accepted)	£15750
Turrell (withdrawn)	15589

IPSWICH.—For new schools in Argyle-street, for the Ipswich School Board. Mr. Eyton, architect:—

Gibbons & Co. (accepted)	£2305

LONDON.—For alterations and repairs to seven houses, Quaker-street, Spitalfields. Messrs. T. & W. Stone, architects:—

Pettigrew & Moyes	£472
Anley	449
Langmead	435

SHOOTER'S-HILL.—For the erection of vineries, melon-house, and sundry works at Shooter's-hill, for W. Carter, Esq. Mr. G. Judge, jun., architect:—

Blake & Ramplen (accepted)	£500

WHITECHAPEL.—For alterations and additions to a factory, No. 65, Mansell street, for Messrs. J. Jacobs & Co. Mr. John Hudson, surveyor, Leman-street, E.:—

Wall	£840
Little	753
Read & Son	716
Jacobs	694

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Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

COMPETITIONS OPEN.

CHESTER, October 31.—For plans for the alteration and improvement of S. Paul's Church, Boughton. The architect whose plan is most approved will be employed as the architect of the works, on the usual conditions, and a premium of £20 will be given for the second best.—Rev. H. Falloon, S. Paul's Parsonage, Chester.

LEYBURN UNION, November 14.—For plans and specifications for a new workhouse, to be erected at a cost not exceeding £3,000. A premium of £50 will be given for the plans and specification chosen.—Mr. R. Chapman, Clerk to the Guardians, Leyburn, *viâ* Bedale.

THE ROYAL NORTHERN AGRICULTURAL SOCIETY (DWELLINGS FOR AGRICULTURAL LABOURERS), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

BELFAST, October 21.—For alterations and additions to the Post-office.—Mr. E. Hornsby, Secretary, Office of Public Works, Dublin.

BILLERICAY HIGHWAY BOARD, October 21.—For the erection of a bridge over the Washway, near the farm of Mr. Merrington, Momtnessing.—Mr. C. C. Lewis, Jun., Clerk, Brentwood.

BOARD OF WORKS (Holborn District), Oct. 21.—For the construction of 960ft. of half-brick sewer and other works in Great Saffron-hill.—S. W. Hopwood, Clerk to the Board, 47, Chancery-lane, W.C.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BRADFORD, October 21.—For the erection of a boundary-wall round the site of the Brayshaw Reservoir at Horton Bank Top.—Mr. W. T. McGowen, Corporation Offices, Bradford.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

CANTERBURY, December 2.—For a concession of the town sewage.—Mr. R. W. Flint, Town Clerk, Castle-street, Canterbury.

CHUDLEIGH KNIGHTON, October 22.—For the erection of a school and class-room.—Miss M. Chichester, Stokelake, Chudleigh.

COWES, October 23.—For the erection of a shop and dwelling-house in High-street.—Mr. T. Halliday, Sun Hill, West Cowes.

DERBY, October 21.—For the completion of the carriage-way and footpaths in Upper Abbey-street.—Mr. Joseph Jones, Clerk to the Local Board of Health, Full-street, Derby.

DUNDEE, Oct. 22.—For the construction of a reservoir for the Waterworks Commissioners.—Messrs. C. & A. Leslie, C.E., 72A, George-street, Edinburgh.

DUNDEE, October 22.—For the erection of several bridges on the line of the water company's pipe track.—Mr. William Hay, Town House, Dundee.

ELLAND-CUM-GREETLAND GAS COMPANY, Nov. 1.—For the purchase of the tar and ammoniacal liquor for a period of one or three years.—Mr. R. West, Secretary, Gas Office, Elland.

GAINSBOROUGH.—For heating two machinery paint shops.—Messrs. Marshall & Son, Engineers, Gainsborough.

GASLIGHT AND COKE COMPANY, October 31.—For the purchase of the coke manufactured at Beckton, from January 1 to September 30, 1873.—Mr. J. O. Phillips, Secretary, Horseferry-road, Westminster.

HORNSEY LOCAL BOARD, November 2.—For the supply of granite, rag, flint, ballast, clay, and hard core; paving, curbing, and channelling, for paviors' work; and for collecting and removing the dust, &c.—Mr. W. Hammond, Clerk to the Board, Southwood-lane, Highgate, N.

KINGSTOWN HARBOUR, November 7.—For the erection of stores, storekeeper's dwelling-house, timber jetty, and other buildings on the West Pier.—Mr. W. Lees, Secretary, Irish Lights Office, Dublin.

METROPOLITAN BOARD OF WORKS, November 7.—For the construction of 2,257ft. of brick and pipe sewers and other works in Whitechapel.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens.

OKEHAMPTON (Devon), November 1.—For the erection of school buildings to accommodate 125 boys and 125 girls, and a residence for the master.—Mr. R. L. Fulford, Clerk to School Board, Okehampton, Devon.

OUDE AND ROHILKUND RAILWAY, October 23.—1.—For the supply of ironwork for the superstructure of a bridge over the River Goomtee, at Juanpore. 2.—For the supply of the ironwork for superstructure of a bridge over the River Sail, at Juanpore.—Mr. C. C. Johnston, Managing Director, 110, Cannon-st., E.C.

RAMSGATE, Oct. 21.—For the supply of 50 gully gratings, frames, and weirs, for the Local Board.—E. Ellice-Clark, Assistant Surveyor to the Board, Town Hall Ramsgate.

S. MARY ABBOTTS (Kensington), October 28.—For the construction of about 450ft. of 18in. brick barrel sewer, laying down about 1,050ft. of stoneware-pipe sewers, building cesspools, gullies, &c.—Mr. J. Broadbridge, Surveyor, Vestry Hall, Kensington.

SWINDON, Oct. 22.—For supplying and laying about 12,500ft. of stoneware pipe sewers, with crossings under the canal, ventilators, gully, pits, &c., for the New Town Local Board of Health.—Messrs. Russ & Minns, Engineers to the Board, 9, Victoria Chambers, Victoria-street, S.W.

WAR DEPARTMENT CONTRACTS, October 26.—For the performance of works and repairs to War Department buildings and property at Liverpool.—Commanding Royal Engineer, Royal Engineer Office, Manchester.

WAR DEPARTMENT CONTRACT, October 26.—For the performance of works and repairs, and supply of building materials at Liverpool.—Commanding Officer, Royal Engineer Office, 12, Princess-street, Cornbrook.

WILBERFOSS, October 24.—For the erection of Church of England school buildings.—The Rev. Thos. Nicholas Walton, Wilberfoss Vicarage, Wilberfoss.

MANCHESTER, Oct. 26.—For the proposed works at Middleton Rectory.—Rev. W. Brewster, Middleton Rectory, Manchester.

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BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

George Scorah, Sheffield, timber merchant, October 19, at Sheffield.—William Mansfield, Birmingham, brick manufacturer, October 30, at Birmingham.

SITTING FOR PUBLIC EXAMINATION.

November 8, J. Pope, Teddington, builder.

DECLARATION OF DIVIDEND.

T. Simmons, Sheffield, ironfounder, div. 2s. 6d.

SCOTCH SEQUESTRATION.

Alexander Wilson, Edinburgh, builder, October 16, at 1.

PARTNERSHIPS DISSOLVED.

Smith & Whiteley, Halifax, joiners.—Court & Parker, Liverpool, oil and colour merchants.—King & Howell, South Lambeth-road, builders.—Maine & Campion, Eccleston-street, Pimlico, builders.—Brook Brothers, Rastrick, Leeds, ironfounders.

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Buenos Ayres Government Certificate.—Translation:—We, the undersigned, at the request of Messrs. Jas. C. Thompson & Co., certify that the Iron Safes of Messrs. Chubb & Son, London, of which these gentlemen are agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th instant; that in our presence they were easily opened with their respective keys; that the moneys and important documents they contained were found in perfect order, and that these safes are now in use in the National Treasury Office.—Buenos Ayres, July 31, 1867.—(Signed) J. M. DRAGO, Treasurer of the National Government; JOSE TOMAS ROJO; JUAN M. ALVAREZ.—A true copy, A. M. BELL.—A large assortment of these SAFES may be inspected, and lists of prices obtained, at CHUBB & SON'S, 57, S. Paul's Churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 395, published Oct. 18, 1872, contains Articles on:—A Few Words About Brightness; Richard Trevithick; Whitworth's Compressed Steel; The Swiss Sky.—Stars in Cygnus; The New Air-Gas; Origin and History of the Slide-Rest, and Various Practical Applications of the Slide Principle.—I.; Reviews; The Origin of the Atlantic Chalk and Ooze.—Why the Water of the Sea is Salt; The Patent Laws; Plating and Coating Metals; Notes of Communications to the Academy of Sciences, Paris; Mechanism; Proctori Ens—Strange's Numerals—Triple Star in Aquila—The Airy Eyepiece—Colourless Sun-Image—Mypoia and Star-Finding—Solidity of a Sphere—Construction of an Object-Glass—Bronzing Telescope Tubes—Species (of Infatuation)—Substitute for a Transit—Semi-Diurnal Arcs—Adjustment of a Level—Hannay's Almanack—and the Last Transit of Mercury; Watch Cleaning; Advertising the "Mechanic;" On the Details of the Construction of Induction Coils—IV.; Horological Matters; The Effect of Colour on the Apparent Distances of Objects; Coal and its Cost; Double Stars; Sidereal Time Indicator, Silvering Glass Specula; The Wooden House at North Tawton; The Milky Way in Cygnus; Plumber's Furnace; The Potato Disease; Screw-Cutting; Theory of Rowing; Expression *a la main* in Organs; Hints on Cheap Telescopes; Bee Keeping; The Gulf Stream; The Planet Jupiter; Structure of Caverns; Compressing Air or Gas; Human Footprints (?) in Coal; Tar-Water as a Cure for Constipation; A Handy Atmospheric Burner; De Morgan and Steam Comets, &c.; Economical Fire-Grates (let 5010, p. 68); A Curious Fact in Chemistry; Screw Chasing Instruments, The Organ Built.—XIII.; One-Manual Organs; The Rainfall of the Present Year; An Improved Method of Taking Impressions from Coins and Medals; Struck by Lightning; Heating by Hot Air; Pianoforte Hammers and Weakness of Tone in Pianos; Our Mathematical Column; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents. Published at the Office of the BUILDING NEWS, 31, Tavistock-street, Covent-garden, W.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 25, 1872.

THE COMPLETION OF S. PAUL'S, AND THE *QUARTERLY REVIEW.*

THE most interesting question suggested by the recent architectural articles in the *Quarterly Review* is probably this—How did they get there? Looking at that periodical as one with a reputation to keep up, the inquiry is even more inevitable with regard to the second article than the first. In the previous case, indeed, as in the present one, the theories were borrowed, and it was the facts alone that gave proof of inventive power; but still the compiler did on that occasion show himself, or herself, to be a reasonably shrill-voiced scold. Now, even that designation would be too flattering: the voice has grown hoarse and the vituperation tame; and we regret to say that we found ourselves nodding more than once over the "Completion of S. Paul's." If this is the case with members of the profession most concerned, it is hard to anticipate any great effect on the outside world; and we doubt if even the pretty pictures borrowed from Mr. Fergusson, to illustrate for the hundredth time the stock comparison between S. Paul's and S. Peter's, will attract many readers to this dreary composition. We have, as before, Mr. Ruskin's theory about the value of the workman's mental power taken up as if there were no truths in heaven and earth beyond it, a process which must subject those who for many years have been really trying to get it acted on, to what the author of "Felix Holt" calls "one of the worst of all mental miseries, that of having their own rooted beliefs caricatured by a charlatan or a hireling." We have Mr. Burges, who has often given the world in a single sentence more insight into Mediæval workmen and their ways than this unblushing detractor in two long articles, set down as a mere "sketcher," in sublime ignorance that mere sketching is just what Mr. Burges has all his life—both by precept and example—been most strenuously contending against. Finally (and here we must acknowledge an original inspiration), we have it solemnly affirmed that there never was, and never can be, any such thing as religious art. The world has been all wrong, from its creation down to the appearance of the *Quarterly Review* for October, 1872. The architects and painters, the poets and composers, who had tried in all ages to dedicate their work to the service of God, have attempted, it appears, a ridiculous impossibility. There is no more religious character in the noblest church than than in the lowest tavern; and, consequently, by parity of reasoning, no more in the "Messiah" than in the last opera song—or in the "Psalms of David" than in the words to which that song is set. Our critic proved three months ago that all living artists or architects were at least either idiots or impostors; he has now included all dead ones in the same category, and the former may bear with the less impatience a condemnation in which their greatest predecessors are included.

It is nothing new for pretenders to fame, hopeless of attaining it in any other way, to seek it by maligning the ablest of their contemporaries. If they are prudent, they will confine their attacks to those who are still on earth; there is little to be gained by throwing mud at the stars. Let our critic, then, if he cannot live without notoriety, and if he despairs of gaining it by any honest work of his own, use his best endeavours to spoil and mangle the work of others. By attacking eminent men, and, if possible, by injuring important buildings, let him strive to get his memory associated with theirs. He may at last earn some brief though contemptuous mention in the history of S. Paul's or the Law Courts, and may have the happiness of attaining the same sort of immortality that belongs to the heroes of the "Dunciad." For ourselves, we here part company with a writer whose only claim to notice arose from the insertion of his articles in the *Quarterly*, and proceed to say a few words about the subject which he professed to treat upon. It is a matter for rejoicing that S. Paul's yet remains to be completed. Had its internal adornment been undertaken by Wren, we should doubtless have only had more scrolls, more acanthus-leaves, and more pudding-faced cherubs with a structural incapacity for sitting down. No architect of equal genius ever turned out such poverty-stricken and unmeaning detail as he; and it is a matter for exceeding thankfulness that the hints of his intentions which remain are few and vague. This, of course, will be scouted as an abominable heresy by the public in general. While a great man lives, his weaknesses are cast in his teeth by every pigmy; as soon as he is dead, he becomes infallible, and above all criticism. What little time each generation can spare from stoning its own prophets, it industriously devotes to building the tombs of those who were stoned before; and woe to him who interferes with it in either occupation. It is dangerous to say one word in favour of a contemporary, and still more dangerous to say one in criticism of a predecessor, and yet the more dangerous the more necessary. When a living artist is praised, all who from one cause or other happen to have a grudge against him make out a list of his faults, and this done, these discerning creatures think they have brought him down to their own level. Far from this, they have actually not even touched the matter in question. The point is not where has he failed, but where has he succeeded; not how much chaff there is in his work, but how much wheat. In this world it so happens that the one does not often grow without the other, and the more plentiful the harvest, the more winnowing is likely to be wanted. There are twenty times the faults in Shakespeare that there are in Pope, yet is there any doubt which was the greater poet? There are twenty times the faults in Wren's works that there are in that of some of his Classic imitators, but then there is twenty times the power, and freshness, and originality. These qualities, however, only come out much in his general conceptions. The designer of S. Stephen's, Walbrook, of Bow steeple, and even, hampered though he was there, of S. Paul's, showed beyond all question that he had invention and ability of his own. He had a gift for making striking compositions out of hackneyed details, but the details *were* hackneyed, nevertheless.

What S. Paul's most needs, then, is "ornamental" interest. Its general arrangement and construction, though we might wish them altered, we must, perforce, leave as they are. Their faults point a moral which was never more needed than now. They arose from the ignorant interference of officious persons, who, with the good luck to find an architect of genius, had not the good sense to leave his genius unfettered. He, like all men with insight and inspirations of his own, wanted to do something new; they, like commonplace people everywhere, insisted on his doing what they considered the "regular thing." Their notion of a great man was that he should be a convenient tool to the imbecilities-in-office for the time being; that he should bow to popular opinion, and especially to the opinion of the influential populace; and generally that he should be guided by the advice of any one who could cackle sufficiently loud to make himself heard. Undervalued and thwarted in this way, Wren left as a legacy to his country by no means the best of his thoughts, but only the best he was allowed to leave. The commission that sat on him, and the pamphleteers who favoured him with advice from their garrets, doubtless enjoyed their occupation; it is to us and our posterity that the pain of the process belongs. That such a man should have been permitted to live and die without showing what he was really capable of is a matter for regret; that he was prevented from showing it by such insignificant busybodies is a matter for indignation. All that now remains is to try and stop the folly being repeated. The completion of S. Paul's is in the hands of an artist who has given proof of art-power and technical knowledge unsurpassed by those of any of his contemporaries. With the exception of the Law Courts, the present is almost the first time since Wren's death when a work of such importance has had the good fortune to be entrusted to any one so competent to deal with it. No wonder, on Swift's principle, that there should be a general howl from all the dunces. All the "*à priori* gentlemen," who can show anybody how to do anything, but have never been able to do anything themselves, see that their theories are in imminent danger of being upset. The omen is encouraging; the empirics of art have paid Mr. Burges the only compliment which it is in their power to bestow, and cheered by their unanimous opposition he may go about his work with redoubled energy. The only means of attaining architectural success in this age, as in all previous ones, is to select the best man that can be found, and let him choose his own subordinates. The more competent the subordinates are the better; the difficulty of architects in this century has been that they are so incompetent, and it has been, and is, their constant effort to train them. But though they were trained to a higher point than ever in the world before, there must still be subordination; there must still be an architect or head designer, whether working or not it matters little, and other designers under him. It will be time enough to believe in communistic architecture when we have seen a communistic painting or a communistic poem; when a ship of the line is managed by the votes of her seamen, and when the plan of a campaign is decided on by the voices of the common soldiers. Till then we shall continue to believe that the selection of a leader is the main thing, and that, this being once satisfactorily accomplished, the mode of his work and the assistance he needs should be left for him alone to decide on.

SEWAGE EXPERIMENTS AT LEICESTER.

WHEN raw sewage has been deprived of a sufficient quantity of water to leave it in the condition of mud or sludge, and has been treated with lime or other deodoriser, the next step, in order to convert it into an artificial manure, is to dry it. This process has always been attended with a good deal of difficulty. There is, of course, no absolute difficulty in drying sewage or any other kind of wet mud or refuse, but the problem to be solved is how to dry the material without driving off or volatilising in the process the very constituents which it is desirable to retain, insomuch as they impart to the manufactured article its principal marketable value. Messrs. Milburn & Co. have recently patented an apparatus for effecting the drying and pulverisation of the solid parts of sewage intended to be made into an artificial manure. A trial of the apparatus was made on Tuesday last at the borough sewage works of Leicester. On the invitation of the patentees a party of scientific gentlemen, engineers, and others interested in the great question of the day, met at the S. Pancras Station in time for the Manchester express, which leaves the Midland terminus at 10 a.m. Among the visitors were General Scott, whose plan for converting the solid residue of raw sewage into cement is now attracting a good deal of attention; Mr. Latham, C.E., the well-known authority on drainage and sewage works; Mr. Cargill, C.E.; some of the directors of the Native Guano Company; and some gentlemen interested in the phosphate plan of dealing with sewage. After an excellent run the visitors reached Leicester, where their number was augmented by the presence of the borough engineer to the Corporation of Leicester, Alderman Kempson, and other gentlemen well known in the district. A short drive brought the party on the ground, where the apparatus was in full work for their edification.

Enclosed between four walls of brickwork, about 18in. in height, is a furnace which is fed at one end of the enclosure through a small stoke-hole. Over this furnace is placed a sheet or hearth of wrought iron, the surface of which is maintained at a temperature of about 260° Fahr. The area of this hot hearth is 180 square feet, or 30ft. in length by 6ft. in breadth. Upon this iron sheet, or rather above it, is arranged a framework of horizontal iron bars or laths fixed in the frame parallel to the breadth of the hearth, in such a manner that they can either be brought in contact with the iron sheet, or be raised above it so as to clear the surface by a space varying from the eighth of an inch to 5in. or 6in. This framework of laths is movable, and is caused to travel slowly backwards and forwards by simple gearing, which will be described hereafter. The length of travel is about 12in. The bars or horizontal laths are about the same distance apart, and in addition to these, which are movable, there are also four vertical gratings fixed to the iron hearth or table, the use of which will be seen presently. Let us now investigate the manner in which the apparatus performs its work. The sewage, in the state of thick semi-solid sludge, is placed upon the lower end of the iron table. In the present case, as the apparatus is only erected for the purpose of experiment and demonstrating its capabilities, it was fed with sewage by hand labour. A man with a shovel supplied it as required. But when the apparatus is applied on a large scale, the solid sludge would be regularly supplied by mechanical appliances. Let us suppose, now, that the necessary quantity of sewage is put in at the lower end, so to call it, of the iron table, and the movable iron laths or rakes have travelled as far forward — that is, towards the front end—as they can. Directly they begin to travel backwards they are raised from the surface of the table, and the rake at the back end, on being lowered, cuts a slice off the sewage, carries it forward, when it begins to travel in that direction; and, in fact, transfers it to the next parallel lath. On again travelling backwards another slice of sewage is taken off by the end rake and transferred to the rake next in order, while, in the meantime, the first slice has been pushed forward to the third rake. It is easy to see that by a repetition of this process, the separate slices or quantities of sewage are passed over the whole surface of the hot hearth and are dried and triturated in the passage. As the sewage is pushed forward by the rakes it is disintegrated by the alternate laths, and also broken up by being made to pass through the vertical gratings already mentioned. But, in fact, very little pulverisation or trituration is necessary. As the material dries, it becomes disintegrated, to a great extent spontaneously.

The gearing is very simple. A shaft is fixed at the upper end of the apparatus carrying a pulley. Upon each extremity of this shaft are attached spur wheels, which communicate motion to other wheels connected with shafts which run longitudinally the whole length of the apparatus; by the revolution of these long shafts motion is imparted to the framework travelling over the hot hearth. Connected with the pulley on the short transverse shaft is the driving belt, which passes also over the pulley of a small portable engine which supplied the motive power during the experiment. The portable engine doing duty on the occasion referred to [illegible] but as it was rather an antique specimen of mechanical engineering, its real power was doubtful. The trial, which lasted a couple of hours, was very successful. In three-quarters of an hour 480lb. of sewage were thoroughly dried and triturated. This is rather a higher result than is usually obtained, or which the patentees would advise. One ton of coal will supply both furnace and engine, while from three to four tons of the dried material are produced. It was the general opinion of the party, nearly all the members of which were competent judges, that the apparatus is the best as yet devised for the purpose. It is, no doubt, susceptible of some improvements, and the patentees at the present moment have them under consideration. An excellent dinner was provided at the "Bell" for the visitors, who were the guests of Messrs. Milburn. Some of the party left by the 6.10 p.m. train, but the majority waited for the up express. The return journey was effected with the same rapidity as the down. Whether recent events have weakened the faith of the public in the safety of railway journeys we do not know, but nevertheless nearly all the party provided themselves with insurance tickets.

WATER POWER.—I.

THE useful power to be derived from water is that of the force of gravity acting on a mass of matter possessing the quality of fluidity, which water possesses perfectly for all practical purposes. Its fundamental force being that produced in it by gravity, the first question which occurs in considering its power is, what does a given bulk of it weigh? The weight of water is influenced slightly by two conditions — its temperature and its degree of freedom from matter specifically heavier than itself. It is the most dense, and therefore the most specifically heavy, when its temperature is 39·2° of Fahrenheit's thermometer. If it is absolutely pure a cubic foot of it weighs at this temperature 62·421b., but at the ordinary temperature (in this country) of 62°, the weight of a cubic foot of pure water is reduced to 62·32lb. But in practice all water that we deal with contains some matter specifically heavier than itself, and a cubic foot of water under all ordinary conditions is taken as weighing 62½lb.

To take it in another way, a standard gallon of pure water weighs 10lb. at the standard temperature of 62°. There are 6·232 standard gallons in a cubic foot, which makes the cubic foot weigh 62·32lb. Again, the imperial cubic foot of pure water at 62° weighs 997·137 imperial avoirdupois ounces, but allowing for some specifically heavier matter in the water this is commonly called 1,000oz., which, being divided by 16, = 62½lb., and, a gallon weighing 10lb., we say there are 6¼ gallons in a cubic foot, although by strict measure there are only 6·232.

It is commonly taken (from Watts' experiments) that a horse of average power does work equal to the raising of 33,000lb. 1ft. high in a minute, if he is not worked more than eight hours a day, or 550lb. 1ft. high per second. Now, as a cubic foot of water weighs 62½lb., his power is equal to the raising of 8·8 cubic feet of water per second. The muscular force that the horse exerts to raise this weight in this time must be greater than this power represents, because no power other than human labour can be applied to do useful work without the intervention of machinery, and no machine whatever can transmit the motive power to the work to be done without absorbing a part of it in overcoming that other and useless part of the work to be done which consists of the retardation of the motion of the machine caused by its weight moving on its bearings, or its friction, as, for instance, the friction of the journals or bearings of the axle of the wheel, the contact of the teeth of spur wheels and pinions, bands, pulleys, &c., so that the horse must exert considerably more power than the weight of 33,000lb. raised 1ft. high per minute represents, and when the power of falling water is substituted for that of horses, a similar allowance must be made. That allowance varies in quantity with the degree of roughness of the machinery, but is probably on the average, in water wheels, one-third of the whole force exerted, so that in estimating the effective power of a fall of water only two-thirds of its full power can be reckoned upon to do useful work. Many water wheels, of good construction, do an amount of useful work equal to three-fourths of the whole force expended on them, but as the work done by many existing wheels is not more than half the full power of the water expended on them, we will take two-thirds as an average. Therefore, if 8·8 cubic feet of water, or 550lb., raised 1ft. high per second, represent an effective horse-power, $\left(\frac{8\cdot8 \times 3}{2} =\right)$ 13·2 cubic feet of water falling through the distance of 1ft. in a second of time, or 792 cubic feet per minute, is equal to one effective horse-power. Now, if we assume a small fall of 6ft., which is probably below the average of falls, 132 cubic feet of water falling this height gives out one effective horse-power; that is to say, any little stream of water only 3ft. wide, falling 6ft., and having a depth of water on the sill over which it falls of 4¼in. or thereabouts, will produce an effective horse-power with average machinery. If we go to a stream of water of greater but yet moderate dimensions, (say) 10ft. wide, and of sufficient volume to give a depth over the sill of 7in., the fall being the same, viz., 6ft., the power of this stream would be that of 7 horses.

But this or any other constant stream exerting itself not for 8 hours a day only but all through the 24, is of equal value with three times as many horses as that number which its nominal power represents, and is equal in this case to 21 horses. This is not an exaggeration. There is no need to sit up all night to make full use of this power minute by minute; we have only to store it during the night, and it will yield to-morrow all the force that has been stored up. The storage of water is, in fact, a paying thing, for while we are asleep it is accumulating, and will certainly yield up its accumulated force when we awake and set it at liberty. If the stream, like most, if not all streams, is not constant, but runs short in summer, and in winter comes down with too great force, all this can be regulated by storage reservoirs. Taking the circumstances of a large number of mills, and comparing the work done with the power which passes them, they appear to do an amount of work, with the assistance of the night water that can be impounded in the dams, which is equal to about one-third of the power of the available quantity of water in any year of average rainfall, without storage other than that of the mill-dams. The benefit, therefore, to be derived from the construction of storage reservoirs is in respect of two-thirds of the available quantity of water. Thus, with storage reservoirs, about three times the quantity of work may be done that can be done without them, but the benefit to be derived is only in respect of twice that quantity of work. The following is an instance in point:—

There are 15 mills in a district above which there is a suitable site for a reservoir which commands a drainage area of 1,000 acres. The average annual rainfall for 14 years has been 33in. The loss by evaporation and absorption has not been ascertained in this particular district, but in others it has been found to vary from 10in. to 20in., according to the character of the ground on which the rain falls, in respect of both the nature of the ground and its declivity, being less in districts of slaty rocks with precipitous surfaces, and greater where the undulations of the ground are not so great.

The district under consideration may fairly be estimated to be of medium character in this respect, and probably a deduction of 15in. for evaporation and absorption would be very near the truth; at least, it would be a sufficient deduction. If the actual loss found by future gaugings should show that only 13in. or 14in. were lost, we err on the safe side. Having deducted 15in. from the whole average depth of 33in., a quantity of water due to 18in. depth of rainfall over 1,000 acres would come into the reservoir. We please to say that we lose these 15in. by evaporation and absorption, but that is a mere phrase to denote a loss. Of course, a good deal must be evaporated, and another portion absorbed by vegetation, and by sinking into the ground, from which it does not again issue within the drainage area belonging to the reservoir; but it is also very probable that over a large area the rainfall is not uniform, but that parts of it will receive more rain than other parts, as a rule, and if the rain-gauge be situated in one of these wetter portions of the district, it will show a result greater than the real one. This is more especially likely to be the case where the rainfall is estimated not from a gauge planted within the district itself from which the water is to be derived, but from one at some distance from it. So that when we say we lose so much by evaporation and absorption we mean that we do not get into the reservoir the quantity of water due to the whole drainage area and the rainfall that the gauge shows. And the great variation between 10in. and 20in. may perhaps be partly due to the situation of the rain-gauge with reference to the actual drainage area to which its register is applied.

Now, the question may arise how we know that either 10, 15, 20, or any other number of inches of rainfall are evaporated and absorbed, for it evidently would be impracticable to make any direct measure of these. The result is arrived at by very great labour and patience—nothing more—and although we venture to state the limits as being about 10in. on the one hand and 20in. on the other, it must always be with some diffidence that anything of this sort can be stated authoritatively at present. But by a great number of gaugings of the quantity of water actually flowing over the ground in each of several districts it has been found that that quantity falls short of the whole quantity due to the rainfall by certain quantities which vary between those limits; and comparing these various quantities with the character of the ground on which the rain has fallen, engineers exercise their judgment as to what allowance to make in any particular district.

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MICHAEL ANGELO AS AN ARTIST-WORKMAN.

THERE are so many and so wide differences between the art of the past and that of the present that it would be a hard task to say where that difference more especially lay, whether in *principle* or in *practice*. Let us take, without going into the general subject, a single instance of it—that of past and present painting as employed or utilised in the decoration of the interior of buildings, churches, chapels, and cathedrals, and occasionally of secular structures. It is impossible to write the names of M. Angelo, Raphael, Correggio, Rubens, Angelico, and a host of others, without a feeling of wonder and amazement at the fact—for certain fact it is—of their being all of them actual *working men*—working men in the true sense of that term, just as much so as the modern working decorator or house painter is a working man now-a-days. Of course, we are speaking of the actual or *bona fide* workman, and not of the designer, or employing contractor, or tradesman, who in these times is the responsible man, and he to whom the public look for the good or the bad in the work produced. In the days of Pope Julius there was one way of going to work, in these of Queen Victoria there is another, and almost its direct opposite. We have been led to these thoughts by a somewhat minute examination of the magnificent series of photographs, for some time published, of the paintings on the Sistine ceiling, of those of Correggio in the church of S. Paul, Lucca, and of the paintings of Rubens, at Whitehall.

It has always been a fixed idea of ours that the whole and the only *real* interest in art work must always lie in the evidence there is in it of the *personality* of the artist himself, and that the more you see of him in his work the better it is, and the more interesting. It seem impossible to overrate the importance of this principle as influencing the mode of art-workmanship. In the Sistine ceiling, throughout the whole length and breadth of it, and in every—however obscure—corner of it, there is evidence of the *hand* as well as the thought of Michael Angelo—its thinker, its draughtsman, and painter; and some of these evidences are so curious—and never noticed before anywhere as far as we know—that they may prove not a little interesting to those who can distinguish between the *painter* and the art-decorator. What a pity it is that some contemporary journal of the time, had there been one, did not dot down every now and then how things were going on, and what the painter was particularly doing on such and such a day. There is nothing, so we must needs find out by hard looking at the ceiling itself, and, by dint of building up a fancy scaffolding, thus to travel about as the great painter himself most certainly did, and find out, if possible, *how* he worked. In the first place, then, having mounted the scaffold, and standing close to the gigantic forms, and being at liberty to move about all over it, it will be seen that there is every possible stage of progress in the designing, drawing, and painting, to be yet seen in it. Michael was of that impetuous, and unsettled temper, that he could not, it is fully evident, long remain on one spot, and so never completely *finished* any one thing. Parts are completed, how perfectly and admirably none who know anything about it need to be told, but a complete picture, needing, or rather allowing of, nothing more to be done, does not exist in the whole ceiling. There are, as we have said, examples of the artist's work in all its stages, from the simple "ground" on which the future picture was to be, to the completed figure subject. In the centre of the ceiling on which there are the great subjects of the acts of Creation, there are *ten* circular panels or rings, held up by linen folds. Some of these panels are quite blank, the painter evidently never having drawn on them at all, others have the merest indications of the future subjects simply scratched on them in the most hasty way, but wherein the lines of the great artist are clearly visible, and his *very* first method of work made apparent. We would especially name the one representing, as far as it can be made out, a man and a pursuing horse. It may be that these rings, being comparatively small, could not be filled with subjects sufficiently large to be seen from the floor of the chapel, which made the painter neglect them. But they are, however this may be, most instructive, as showing method of work.

Again, there are evidences of the mode in which the architectural forms were lined in. In some parts of the ceiling the lines run into and over each other, and the ends of the lines have not been erased or covered over by subsequent painting, so that the "working drawing" of the ceiling is yet to be seen on it by the eye of the curious. There are, too, in these purely architectural forms all kinds of minor differences, and, as some will think, "imperfections," for the painter in the progress of the work amused himself by varying perpetually the method of his work. In some parts the painting is done with the utmost refinement of finish and care; while in others he would seem to have brushed in almost any thing to get rapidly at the general effect, careless of exact detail. Michael, too, it is said, was of hasty temper; the ceiling proves it; he was certainly a strong man, with a right good arm and wrist, for nothing can possibly surpass the magnificent easy way in which some of the *curved* lines are drawn in. We must specially refer to the festoons, or rather suspended lines, which hang from the sculls over the pointed arches to the corners of the triangular spaces on which are painted the demonaic forms. In the common prints of the ceiling these are represented as all alike, but in the work itself they are all different. Some of them are put in with a *single sweep of the brush*, and the power and steadiness of arm needed to do this must have been wonderful. M. Angelo was certainly not quite so "sublime" a man as history and writers on painting say he was, for of two trifling things he was not a little fond—*rings* and *folds*, or strips of cloth or linen. He seems never to have missed the chance of making use of these. Some of these rings are painted with a care and with a skill in perspective which Albert Durer might have envied; and the way in which the linen fold is run through the ring, and made to do its simple work, is beyond all praise. We have often thought how much better and more improving and "educational" it would be if our Royal Academy students were but sometimes set to do such work as this, rather than waste the precious time in endeavouring to compass the imaginative wonders they now so often attempt in the painting school and otherwise. Let them learn of Michael, and see how he did all these commonplace things so magnificently before he painted—or while he painted—Sibyls, and Prophets, and Creative acts!

And, again, the late President Eastlake spent a good deal of time and no small learning in the examination of this ceiling, but it is more than possible to be too learned, and to take things too seriously and solemnly. Sir Charles could not explain and expound everything here, for the great painter himself did not always know what to do next, or even how to do it. He went about this grand work making all sorts of *experiments* in painting and drawing, and composition, and sometimes not being able to think of any thing quite to his mind, and fit for the subject-matter of the ceiling, threw in some giant form simply to fill up the vacant space. It would be going somewhat too far into detail to prove this absolutely, but it has occurred to us that the original, or, it may be, the after intention, of M. Angelo with the sculpturesque nude figures in the long centre panel of the ceiling, and which seem to be merely "decorative," was to make them emblematical of human passions, or rather of human feeling. They have been called athletæ by Eastlake, but surely without a particle of reason. They are most wonderfully painted; some of the hands and feet are perfect in form and grace of movement. They are second only, if they be indeed second, to the great figures of the prophets beneath them. If, then, the prophets and sibyls be intended by this great and wonderful poet-painter and artist-workman to embody the spiritual stature of man, surely these forms may be meant to incarnate his common humanity, his naked form and figure, his flesh and its life. If the "antique," such as the Torso or the Greek Theseus, is more studiously exact in its measured proportions, these wonderful forms are the more full of common life and feeling. Does the "figure" gain or lose by the impress on it of the artist-hand? There is in these figures an infinite variety of technical skill and painting power displayed, and the painter seems to have gone at first to one and then to another, as the humour seized him. No one can fail to see, the more he looks at the work, how thoroughly Michael Angelo enjoyed and luxuriated in the mere *act of painting*—he loved the very use of the brush, and went about this ceiling perpetually doing more and more everywhere. It is the very acme of artistic work, ease and capacity combined, and the knowing what to do, and then doing the work, whether great or small, *himself*—the great artist-workman!

We might dwell, and with profit, we think, on each individual figure, for all are different. There is something peculiar to each one, even in method of execution; but we can but generalise. If the *drawing* in this great ceiling is marvellous—and the more it is looked at the greater it grows—then is the light and shade, the mere technical management of it, not less so, even, indeed, if it be not the greater. It seems an easy thing to those who know nothing about it practically to draw a simple curved line, or fold of drapery, or ring and rope; but it is not so, and the very highest artistic power, as here, may be employed on it. Neither is it easy to paint a shadow, or a dark or misty background, or to throw an object into shade or deep gloom. It is impossible to say, indeed, what special power of hand and mind, or what combination of them—what precise faculty it is that does the work. It is Nature working in secret, no man knowing how. In some of these backgrounds (and we are speaking simply of the mere flat vacant space or wall beyond the figure, whatever it be) it will be found that the power and feeling—we use the word in want of a better—of the true artist is manifested. In common painting, as everybody knows, as in ordinary house painting, the colour lies all even and flat and opaque on the substance it covers; there is no transparency, no looking *into*, or through, the thin layer of colour and oil: it is all dead, and dull, and even *paint*, no matter what the colour may be. The ordinary workman can do naught else, but with the *artist*, whatever he may be made up of, it is quite different. All this opacity and dead flatness is at an end, and the dull and dead paint—such as that which covers the inside of S. Paul's, but which they are now cleaning off (although put there by a Royal Academician!)—has no longer any existence. Some miraculously transparent medium is worked, as if by magic, on to the canvas or wall ground, a something we can see into and through, and a something which you seem never to be tired of looking at—a vague mist—the mind of the painter through his hand, but through his only!

It would greatly exceed our space were we but to attempt the long proof of all this. It is a work for the future, but unhappily when, perhaps, it may be a future when it will no longer be possible to appeal to the mighty work of Michael Angelo itself. Everything in the artistic way that remains of the past is in active course, as all know, of being "improved" and "restored," and the time must come—and we have some reason to know it—when this most wonderful ceiling and evidence of the power of art-workmanship must come to have its turn. It is simply frightful to think of, for what will happen is and must be this, that the whole ceiling will be what is termed *repainted*—*i.e.*, every part and portion and fragment of the actual hand work and writing of Michael Angelo will be blotted out, and covered over with common colours by a tribe of assistant "art-decorators." All the magic of the work will vanish and disappear, not under cloud and mist, or slow decay, but under the thick, opaque, dull, dead colour which such inferior hands are sure, for they cannot help it, to put out its light with. It is appalling to think of. Can nothing be done to avert it? We would suggest that in the event of any action being taken, a strenuous effort should be made to *photograph* or *autotype* the whole ceiling in *sections to as large a scale as is possible*. It is a work for a Government, not for a single man. It is infinitely to the credit of the German that he was the first and the only man who enabled us, through the "autotype" process, to see the ceiling as it really now is, but his work, good as it is, is *too small* and fragmentary.

C. B. A.

THE COMPLETION OF S. PAUL'S.

(*From an elaborate article in the last number of the "Quarterly Review."*)

(*Concluded from page* 303).

THE Mediæval paintings and mosaics were the work of little educated men, who illustrated the legendary stories about saints and martyrs in a simple, workmanlike, artistically conventional, and rudely fanciful way. There was no "ecclesiastical element" in the art, but only legendary subjects for Art to work upon. The art itself was genuine, and if his knowledge of history and anatomy, and his theological views, were limited, and his pictorial statements consequently faulty, the artist in his works used what he did believe frankly, not as a doctrine, but as a popularly recognised and simple fabric, on which he might embroider and display, with his whole power of thought, the rude or more refined expressions of his fancy.

Hence the impressive dignity in the uncouth frescoes and mosaics of what are called the "dark" and middle ages: we see true, unsophisticated, manly work; strong, independent, careless of applause, and evidently uninfluenced by mere sacerdotal power. And if our admiration of the artists and their work must be conventional, it is, at all events, sincere. But when in later times painters became men of renown, had gained position, and, in fact, were of the world, the Church could then degrade them; and they were hired to paint, not what they believed, or what they felt, but the weak falsehoods that the Church then used to mystify the vulgar. Thus their work fails to command respect. We recognise its cleverness, but we despise both work and workmen, and we thus perceive the decadence of Art. Those who most advanced the art of painting were just those in whom the simple human element is most pronounced. Giotto, Massaccio, and Michael Angelo had small regard for the ecclesiastical element. They painted in churches and for the Church, but the Church was very glad to get them to paint their own and not "ecclesiastical ideas." There was no attempt or inclination in the Church to overstep the artistic boundary. Builders, and painters, and artificers, were the designers, and the judges, among themselves, of their own work. In those days clerics and connoisseurs did not interfere in work beyond their skill, nor yet pretend to judge without due knowledge. Let us retain the idea of interference, and, somewhat changing the characters, suppose, for instance, that Mr. Penrose and the Cathedral workmen were to invite Mr. Spurgeon, as a man of genius and vigour, to scheme the cathedral services for the coming century, and we may be led to perceive the present artistic aspect of this enterprise for the completion of S. Paul's. Whenever, then, the Church did intermeddle in art, and the ecclesiastical element became obtrusive, art sank into inanity. Weak men became the poor instruments of an aggressive priesthood, and in the churches of the Jesuits throughout the world we have the effect of the ecclesiastical element revealed in the lowest debasement to which art has ever fallen.

In England we may see a corresponding decadence. We have already had to note the state of architecture; and now, with special reference to S. Paul's, we may add that church furniture and decoration are in demerit well adapted for the bad character and style of building work with which they are associated; and all the showy brass and iron work that make our cathedrals look like "metal courts" at an international bazaar, are, as works of art, purely mechanical, just on a par with bright steel fire-irons, or with Armstrong guns. No men of any worth would willingly take part in such mere drudgery. True artists will not work, as such, at secondhand. Wren had not this to learn. Gibbons and Tijou did the wood-carving and the wrought-iron screen-work at S. Paul's, and both were, like the old masons, "free," and so wrought out their individual fancy and design; and their work, within the limits of the necessary style, is excellent, and full of workman's thought. But almost all the showy carving that is used to decorate our Gothic buildings is but a knack. The men know how to cut two or three forms of leaf, and these are constantly repeated. Why should they do otherwise? They are the carver's men; the carver is the builder's sub-contractor; the builder has no care except for his certificates; the clerk of works is but a deputy; the "architect" is absent, and for the most part ignorant, and only glad that so much show can, with no cost of trouble to himself, be placed on his poor miserable building, and also to his credit; and *he* receives much praise and thanks from the beguiled proprietor, the man of taste, who, far too fine and foolish to associate with any working people, pays money for this trash, and, for his pains, is just a simpleton.

Good artists' work can hardly come of such a system. We can scarcely recollect one piece of modern carving that would make one wish to know the workman. This desire is a good test of work, but varying, of course, in value with the susceptibility and discernment of the beholder. Among the clergy, the desire is not to see the workman, but that others should be pleased to come and see what their "architect of eminence" has done to beautify their church. The motive here is vanity, not love of art: its object, vain display, and doubly vain applause. Art has no share in it; and, for anything the greater part of all the decorative work is worth, it might as well be printed off and pasted up by paperhangers, so that, the fashion changing, it might be easily removed. We lately heard some clergymen comparing notes about their newly "decorated" churches, and the wonders that their "architects" had done—the ladies also learnedly discussing their new wedding dresses "fresh from the milliner's"—and we observed that, in artistic value of the subject, soundness of taste, and critical acumen, the ladies had by far the best of it: their dresses were, in fact, designed and made by an accomplished artist in her way, with careful study both of figure and complexion. But the church decorations were concocted by the working draughtsmen at a factory—called now a "studio"—a hundred miles away, and then some labourers put the colours on, with no idea or care that every form and tint should, in its measure, add to the effect. This decoration is, in fact, a trade, dealing with areas and stock technicalities of colour and of form, and then with ignorant employers; and as it spreads throughout the country as an evidence of weakness and credulity among the clergy, it will eventually cause scandal and well-earned ridicule. Are there no men of sense among them who can discern the difference between a trader's fashion and true art, between the genuine workman and the spurious "architect"? Cannot the clergy see that, if their church is national, they best represent it when they pass the middlemen, and, seeking those that "labour and are heavy laden," show them that work should properly alleviate itself by constant unstrained mental exercise; and, avoiding the delusion that the "masses" can be "elevated" merely by reading and amusements in their leisure, make every workman understand that, by a disciplined imagination alone can he be raised, and though this imagination should have higher aims yet it can best be exercised upon his common daily work? Or are the clergy, instead of being active and judicious benefactors, to remain submissive, wondering dupes, combining with the self-seeking herd of business men in grasping and securing the material results by which a low success is measured, and neglecting those great duties whose supreme reward is beyond human scope or worldly estimate?

Much good has been anticipated from the Schools of Art, where drawing and design are taught; and to those who inspect the schools, and do not look beyond, there seems to be success. Really, however, these schools at present are, to working men, of little value. They are an inversion of the proper course of things. A child is not taught to speak or read before it has ideas and observation. It would be useless to teach an idiot to make words on paper which he cannot understand, or to set a boy to copy Homer ere he had learned the language. The method at our schools of art is parallel to these; and drawing is now held to be essential to the making of an artist. We might as well suppose that poetry originates in perfect penmanship. What is required is not the art of drawing, but that imaginative freedom of the workman which will develope art in common work. A mason or a smith requires little drawing; a week's attention would suffice to give him all he wants for present work, and a few hours' application would help him through on occasional difficulty. What these men want is direct patronage, and such present guidance in their work as shall lead them to the habitual use of observation, judgment, and imagination, and while "surveyors" and contractors exist this is impossible.

Some years ago, when Salviati's mosaics were first used at Westminster, we were informed that such mosaic work was found particularly useful, since it was designed, made at a factory, sent to any distance, and applied with facility and promptitude. All true enough, but the result is "art manufacture" merely, without a touch of real art. On the other hand, when security was sought against the forgery of bank-notes, the most intricate patterns were proposed, and infinite cleverness of printing and paper-making was suggested; but after long and careful search and consideration it was discovered that the working man was the true source of safety, and that the work of the best engraver to be found was, after all, the only security for the acceptance of these tokens of the financial credit of the country. Schemes and patterns were found valueless in comparison with true intelligent handiwork. Art comes direct from the mind and hand of the designing workman. Raphael's cartoons are works of artistic value, but the tapestries for which they were designed are articles of sumptuous furniture, not works of art. So again in painting, it is not the copy, in colour or otherwise, but the master's own work that is esteemed. In architecture, a perfect model would be of no value in comparison with the shattered fragment on the Acropolis. And an "architect's" drawing or sketch may be of some small value, and thus it captivates the "connoisseur;" but his building will artistically be worthless in comparison. Wren lived in a time of transition, and though "surveyors" were required to design after the new manner, there was, as we have said, considerable freedom for the working man; indeed, the working smith was not entirely subdued until the commencement of the present century, as the good iron-work in our old west-end squares will testify. Wren, as we have seen, proposed to send for four mosaic workers from Italy—a very sensible proposal, following unconsciously the true old English way. The Venerable Bede relates how, a thousand years before Wren's time, Wilfrith and Benedict Biscop brought over workmen from Italy to teach our forefathers to build in stone, with the windows glazed "that the unclean birds"—"decoraters" imperfectly developed—"might not fly in." Again, Wren was imitating the example of "Richard de Ware, elected Abbot of Westminster in 1260, who, going to Rome for consecration, found there Pietro Cavallini manufacturing mosaics. On his return he brought with him rich porphyry and other precious stones for the shrine of Edward the Confessor in his abbey-church; and for the pavement before the high altar. He also brought over fit artists for the work." "One Odorick" was the master workman, and the Abbot of Westminster had the care of the work.

We will then suppose that in a similar manner the Dean of S. Paul's, having, by great care and study, both of work and workmen, made himself "able to judge," should undertake to choose "four artists" and to purchase the materials for the mosaic work. We would advise a visit to Italy for this purpose, and the best workman there should be engaged, with liberty to nominate three others younger than himself. They should be liberally salaried, and should be in direct communication with the Dean for all questions of design and general interest about the work, and with the Cathedral Surveyor for all special building or constructive matters. There should be no hurry to commence the work or to finish it. The workmen should be allowed to test repeatedly the effect of colours before commencing the Mosaics, and they should begin, not as our "sumptuous" friends desire, in the choir, but in the most obscure parts of the building. Wren proposed painting for the 24 cupolas, but we would take the liberty, which the "surveyor" would no doubt gladly have conceded, to substitute mosaic for paint, as "more durable;" and also as an opportunity for considerable practice and experience before reaching the main dome. The workman will have to become accustomed to the building, to study it hourly, daily, and throughout the year; and with experience and knowledge of the power of colour, in large or small surfaces, at a considerable height; and of light, greatly varying in direction, force, and combination. His attention must be unremitting, and his judgment always ready, lest a single tint should be inharmonious, weak, or exaggerated. The mosaic might even be fairly good in itself, or in part, and yet it might greatly damage the effect of the interior. Thus it would evidently be just as sensible for a painter to order a face or a feature from Italy to insert in his picture as for any but a resident artist to pretend to complete the decoration of S. Paul's.

These men should not merely do the work, but should make the entire design. An intelligent workman is far more to be trusted than any of our sketchers and schemers. Great works "of decorative" art can be done without great committees, and even without "eminent architects," but absolutely not without great workmen. These must be very much superior to any committee or "drawing-master" before we can have works of art that would be worthy of the name. If the Dean would listen to the foreman at the Wellington monument, while he reviews the bas-reliefs that are inserted in the east and west walls of the chapel, he will perceive that it is not rank in a false artistic hierarchy that is a test or evidence of merit, or the want of it. This that we have described is the way of art, and there is none other. As to the general design, S. Peter's dome seems to be a satisfactory example, and so Wren considered it. The architectural effect and character are well maintained. With the restraint of the Classical Orders below, it would be incongruous to treat the ceilings and the dome with unrestraint. The object is to complement Wren's own work, to glorify his building, not to discredit it. A few simply drawn and flatly coloured figures might be introduced singly, or generally so, in the large panels — but as few feathers as possible;— and nothing of the ecclesiastical element, or what schemers pretend is Christian art. The vulgar invocation or abuse of all sorts of "Angels," "principalities," and "powers," with a company of "martyrs," and some "pious ladies," is but an "artistic" form of profane swearing—a mere expletive substitute for fancy and invention, that affects the nerves of young ladies and ecclesiastics, and is consequently supposed to be the utterance of "a sanctified imagination." It ennobles no one, but it degrades the subjects of such low freedom; and all the knowingness about precedence of "choirs" and "seraphim," "princedoms" and "dominations," is just the sort of trash to fill and agitate the brain of a self-constituted master of the ceremonies to the angelic world.

Our working man would rise into no such visionary spheres. He would not first, as the "Appeal" suggests, begin upon the choir or dome, but in a modest and judicious way would gently and with care make trial of his powers in the obscurest corners of the church, and then correcting and improving daily as he thoughtfully proceeds, would make the choir the climax of the work, and so, when all his years of multiplied experience and intellectual growth had made a master of him, he would finally, by a seeming magic power, illumine that dark cavity of dome with all the glorious splendours of the empyrean.

Such is the artistic way in which the work should be accomplished, but the "Appeal" would never lead to any such achievement, and as its claims and its proposals are entirely inconsistent, one or both should be withdrawn. Then the Committee and the Dean and Chapter would be well advised to undertake first those works that would be most obvious and satisfactory to the greatest number, and at the same time most beneficial to the building, and if the exterior and interior are made properly approachable, and cleaned, and lighted, much will be gained for further operations. Then, secondly, the interior might be made suitable for the future work of the Cathedral; and, thirdly, Wren's suggestions for the decoration of the dome and ceiling should respectfully be followed. The inlaid marble work is no affair of Wren's; it would be entirely inartistic, and worse than a waste of money. Were there no pilasters or "Orders," the plain walling might, with propriety, be decorated by a veneer of colour, a sort of large-patterned mosaic; but in S. Paul's the parti-coloured marble panels and pilasters would be a feeble imitation of the low-bred extravagance displayed by the more disreputable Papal families at Rome. At S. Peter's the marble work and gilding "impart a fuller idea of sumptuousness" than Wren ever thought of for S. Paul's, and make the interior look like a splendid vestibule for a huge palace. It is not simple but "imposing," and addresses itself to the low and worldly rather than to the more lofty and pure-minded portion of mankind. S. Paul's wants light more than colour, and the effect of coloured marbles would be to damage rather than to glorify the church. Some slight panelling of colour might, perhaps, with great care be introduced, but the contrast between the piers and walling, and the rich but—emphatically—not heavy ceiling should be well maintained. The floor should be of marble; dark, to give solidity to the building, mixed with verd antique, that the cool colour may by contrast make the walls look warm, and highly polished to reflect the light. A building such as this requires different treatment from the choir at Chichester. The stained glass, home and foreign, at S. Paul's is of various qualities and styles, but all alike abominable, and should be promptly sold to any bidder. We would advise advertisements to speculating builders. This glass is another evidence of the absurdity of entrusting decorative work to distant manufacturers. The workmanship and the material of Munich glass are excellent, but its principle is all erroneous, and its use entirely without appropriateness or artistic sense. We find stained glass used daily throughout England and the Continent, without the least regard for decency or fitness, till our churches have expressive rivals in the class of showily-dressed women, or disreputable-looking and bedizened scullery-maids. S. Paul's wants no stained glass, it has no "storied windows." The "dim religious light" does very well as a poetic phrase, but it is nothing more. Windows were evidently *storied* that in spite of all the "richness" the light might *not* be dim. King's College Chapel is light enough, but, we apprehend, not therefore irreligious. Wren did not design S. Paul's for stained glass, and if Wren's intentions are to be regarded, then stained glass is out of the question. The building is entirely unsuited for it, and it for the building. The present light is insufficient, and all that can be gained will not be more than enough. The walls are thick, and the piers large and obstructive, so that the windows are not obvious at a glance, but are only visible in small groups, or one by one. Thus there can be no general effect of colour from the windows in conjunction with ample light, as in a Gothic building like the Chapel at "King's," but only a very stupid obscuration, with no religion in it, and some insolated and entirely incongruous patches of colour. Great men are not always wise, and can afford to learn: let the Committee remember S. Michael's, Cornhill. The glass, then, should be white, as at S. Peter's, or very slightly flecked with colour, to neutralise the dirty tone of atmosphere and light; the glazing delicately fine, with narrow bars, but the panes not large, in order to avoid the drawing-room effect of modern churches of the Italian style. Then all the childishness and fanciful profanity that assumes the name of "Christian Art" should be quite cleared away, and carefully excluded from the church. We need not spend our time upon "Te Deum" puzzles, or make playthings of the "emblems of the Passion," and then, like the "Worcester" Chapel critic, become "impressed" by them, or seriously play the fool with all the Calendar. No man of any genius or power would degrade himself by taking any part in any such "ecclesiastical," imposture, or so deliberately trifle with the childish public. That was not Giotto's way nor Buonarroti's. Their art was certainly not "ecclesiastical," but manly, dignified, progressive, original, and true, and also appropriate to the "Sistine" and "Arena" chapels; where no stained glass obscures the necessary light, and there are no obtrusive "Orders," but the paintings are the decoration of the buildings. When we produce a Giotto or Massaccio, and have sufficient knowledge and artistic sense to find him out, by all means let us seize him, shut him up in the Cathedral, cut away all the "Orders," Wren notwithstanding, and let him glorify the building in a way not "ecclesiastical," but human and divine, a way that Wren himself had no conception of. Such men may be, perhaps, found when they are really wanted, but not certainly until we have considerably got beyond the people who call tenth-rate "architects" and decorators men of eminence, or who declare that the "ecclesiastical element" is wanted at S. Paul's. It is remarkable that at this stage of architectural depravity we should be unable to supplement its weakness by any other art. The figure carvings at S. Paul's do not afford us hope; they are, in fact, a group of national "ex-votos," with all the hideous deformity and bad taste that are the special characteristics of such "thankful" and "memorial" displays; and of the paintings that were shown this year the most attractive seemed to be those that exhibited the ablest combination of man millinery with knack and greed; but of the dignity and power of mind that indicate the master, and would be worthy to adorn a Christian church, not the least evidence.

THE LADY CHAPEL, CHICHESTER.

THE Lady Chapel of Chichester Cathedral, which has just been restored by Sir Gilbert Scott, was reopened on Saturday week. The history of this fine specimen of Decorated Gothic is interesting and peculiar. The two most westerly bays were a portion of the ancient Norman church; the eastern portion was added by Bishop Gilbert de Sancto Leofardo about the end of the thirteenth century, all the windows being then adapted to the more advanced style of architecture. The restoration was beset with many difficulties, and but a very few years ago would have been pronounced hopeless.

The floor of the chapel had been raised 2ft. to give height to the vault (which has for many years been the burial-place of the Richmond family), thus destroying altogether the symmetry of the building. The beautiful windows were bricked up, and a huge fireplace introduced to adapt it to the purposes of a chapter house and library. At the death of Bishop Gilbert it was resolved that the chapel should be restored as a memorial to the deceased prelate, and the consent of the Duke of Richmond was obtained for lowering the flooring. The graceful tracery of the windows has been restored, and the vaulting of the roof cleaned and strengthened. A good deal of the ancient delicate carving of the bosses and mullions is still in good preservation; even the colouring and gilding are not altogether obliterated. The floor has been laid with encaustic tiles made in accordance with tiles found on the spot. The cost of the restoration has been about £2,000.

CATHEDRAL AND OTHER LARGE ROOF COVERINGS.[*]

WE once knew a respectable and trusted septuagenarian civil engineer, always deemed a "safe man," and who had risen from the ranks under Telford, and who had in the course of years collected a large bound-up folio of designs of all sorts taken from executed works, chiefly of Telford and of John Rennie. Whenever he was called upon for a design, out came this folio Bible—the appropriate engineering text was looked out, and Mr. Blank soon came forth for, as it might be, a set of dock cranes, with designs line for line as the *magister* had designed them nearly fifty years before.

It was conveniently safe practice, for had not all these designs been seen to answer their purpose? and it saved a vast deal of trouble and all calculation, which might have proved difficult. But it was often expensive to Mr. Blank's clients, and sometimes struck the younger and outside world as being "behind time"—as when John Rennie's cast-iron crane jibs, or those of Telford, with tensile and strut members of such jibs all framed in oak, made their appearance after the post wrought iron epoch of engineering had set in. This sort of engineering, according to sample merely, has happily nearly or quite died out, but it holds its sway very much amongst the professors of the elder sister art of architecture.

"Precedent," often ill understood as to what it really means, there rules supreme amongst the more mediocre men at least of that noble profession. "Behold the old paths, walk ye in them," is very generally as much the creed of the church architect as of those who are supposed to teach under the roof he has reared.

"Art"—properly so called—fine art—is, except indirectly or occasionally, outside our proper province; we shall not, therefore, enlarge upon the true scope and uses of "precedent," for which we may refer our readers to the lucid views of Viollet le Duc, who, in the noble article "Constructions," in his great *Dictionnaire de l'Architecture*, has well pointed out the difference between that slavish imitation of ancient methods and forms, because they *are* ancient, which is in all nations and times a mark of the decay of art, and intelligent reasoning out which evolves its design with a full knowledge and feeling for the old, but with a clear and logical perception of the materials, the methods, the uses, and intentions of the new. It was this intelligent reasoning out of their designs in view at once of the past, of the aim and uses of the edifice, of the materials, the skill of the workman, and all other concrete conditions as well, and not a mere construction by "recipe," that, as Viollet le Duc has shown, really characterised the architects, whether lay or cleric, of the middle ages, whose greatest works in chateaux, town halls, abbeys, or cathedrals, still satisfy the cultured man with the sense of united fitness, beauty, grandeur, and durability.

We have been led to these remarks, as the question has risen in our minds, What is likely to be the method of restoration to be adopted as to the partially burnt-off roof of Canterbury Cathedral? Being but partially burnt, it is but too probable that the economic consideration of utilising what remains may come to the help of blind precedent in deciding that, as heavy timbering and lead cover were deemed the proper thing when the cathedral was originally roofed, so it ought to be and shall be the right thing still; and so the new roof shall be as combustible and as constantly after a while needing expensive and dangerous repairs as that which has in part perished.

Now, we might quote the very words of Viollet le Duc—the greatest, most practical, and most cultivated of Mediæval architects—in our support when we affirm that if the architects of the eleventh to the fifteenth centuries had had iron at their command in the facile forms and abundance that we have, they never would have designed a timber-framed roof; and we do hope that those with whom the decision at Canterbury may rest may determine upon sweeping away what remains of the partly burnt timber roofing, and replace the whole with a well-designed roof-frame in wrought iron.

This is what actually was done with the fine Cathedral of Chartres, in France, after the ancient roof was burnt in 1835, if we remember rightly. But then comes the question of covering for such a roof placed upon a Gothic cathedral, and upon this point, which has far wider relations, and ought not to be without its instructive lessons to the engineer as well as the architect, we purpose offering some remarks. The iron framing for such roofs should be designed upon a widely different type from that admissible or best for the exposed and visible skeleton of roofing, often of vast span, for railway stations, markets, exhibition buildings, &c.; in all these the covering material is light, and a large amount of elasticity, or even flexure and spread in the structure are allowable. The iron frame over the light and adventurous stone groining of a cathedral must neither grip the walls nor tend to spread them. It must so rest upon the walls as to accommodate itself to gutter, parapet, and pinnacle, and its arrangement of internal parts must be such as to allow the freest possible space and passage from end to end over the groining, nowhere to be touched by iron, and, for reasons chiefly connected with the covering, the frame must be very rigid, and yet its rigidity not obtained by ponderous scantlings and lavish expenditure of material, but rather by the just and mechanical disposition and combination of its parts.

The designs for the iron roofing of the Houses of Parliament, by the late Sir Charles Barry, architect, combined several of these conditions; and though the frame is overloaded with material—even considering the very heavy metallic covering—these roofs would have presented a very favourable adaptation of new material to Tudor architecture had they not been marred by the unfortunate application of plates of galvanised cast iron for the covering. That adoption was the result of imperfect knowledge of the minuter chemical and physical properties of the material, which is often as disastrous as absolute ignorance. Sir Charles Barry was satisfied with the common loose dictum—which even still we hear every now and then repeated by engineers and architects, though based upon nothing but imperfect observation—that cast iron rusts much more slowly than does wrought iron, and he had great confidence in the fact, at that time much-vaunted and well "certificated," of invulnerability of galvanised iron when exposed to the corrosive agency of air and moisture. Of three capital facts he seems to have no knowledge:—(1) That the air, rain, dew, and fog of our coal-burning cities act very differently, and with much greater intensity upon iron—whether cast or wrought—than do the air and precipitations of extra civic places. (2) That galvanisation (zincing) can produce but the most imperfectly continuous coating upon *cast* iron; that all iron corrodes unequally, or by "pitting," cast iron especially, and that the latter is so heterógeneous a compound as to initiate its own corrosion—so that a thick plate may rapidly eat into holes at places, while its general surface is little affected. (3) That galvanising, even when perfectly done—as it only can be upon wrought iron—presents but the most ephemeral resistance to corrosion when immersed in water, or when freely exposed to air and moisture of coal-burning cities.

The result on the Houses of Parliament has been that the thick covering plates of galvanised cast iron were rusty and eating into holes within four or five years after their being laid; and a foreign chemist—armed, it was rumoured, by some occult patronage of the late Prince Albert—was brought in to doctor them with "Zopissa's" and "granitic" paints," which, we believe, have proved in this case neither better nor worse than the imperfect cover given by inferior oil paints, which have resulted in providing the satisfactory privilege to the scientific inventor of having a monopoly in making the outside of the platter and cup clean to the public eye by about an annual coat of paint upon the vast surface of those roofs, the local corrosion of which is going on beneath nevertheless.

Let us, therefore, put any covering of cast or wrought iron plates—galvanised or not—out of the record for roofing of future city or town public buildings. We make no exception, either of the "Lavenant" or other enamelled iron; for although that thin glassy covering is unquestionably resistant of corrosion, even in coal-smoke-loaded air, surfaces so treated will not bear walking over, or being exposed to scratches or rubbing of any sort, without loss of their protection. Then, as to lead, we must equally repudiate it, though for a different reason. It must be laid upon a continuous surface of support. We cannot lay it upon any open system of rafter and purlin of iron; we must "sheet" over these; and no material suitable for such sheeting is to be found, except the old timber boarding; and this alone remaining combustible upon an iron-framed roof, the latter would be much less likely to be destroyed by fire than if the frame were timber also, still the whole structure would not be, as it ought, as perfectly incombustible as the stone groining beneath.

The lead on Chartres Cathedral was laid in breadths of only about 2ft. wide between the "rollcaps," each sheet being about 5ft. long, and in thickness about 6 millimetres, or nearly ¼in. Thus, well laid and so thick, there were considerable surfaces that had been laid in the thirteenth century, and still prior to 1835, free from crack or defect. This, however, is an extreme case, and does not influence what we adduced in a previous impression as to the constant necessity for patching lead roofing.

Pure and well-manufactured metallic zinc in rolled sheets, such as are produced so largely in Silesia and in Belgium, stands in a very different category from that of galvanised iron as a covering. In an atmosphere reasonably free from coal-smoke it is extremely durable, and it even resists tolerably the saline atmosphere of the sea-shore. It is not rapidly acted upon by smoke-laden air, but yet it is acted on, and hence can only with hesitation (notwithstanding some important decisions to the contrary on the Continent, which have so far justified themselves) be recommended for cathedral or other important roofing. It possesses, on the other hand, great structural and artistic advantages. It can be laid upon open iron roof framing without any sheeting beneath, and, when properly laid, it never "cracks" nor needs repair as lead does. It is not deteriorated by the rough contact of ladders or boot-soles. It lends itself—through its great softness and mouldability when heated to about 300° Fahr.—to the production of the boldest as well as the most delicate or complex artistic forms of the architect, and hence is a precious material for the production of enriched dormers or roof-lights, ridge or gable crests, finials, &c., as may be seen in multiplied instances in Berlin and many other cities of Germany and Belgium, the sky-lines of which are, thanks to this material, often very good and striking.

It has been alleged of zinc that in the high temperature and powerful currents of air of prolonged or serious conflagrations, the metal itself takes fire and separates into flying flakes of incandescent metal. That the great affinity of zinc for oxygen at or above a red heat may produce this result is certain; but we believe the instances as connected with roofing have been very rare and exceptional, and the evil results exaggerated, if not imaginary. Zinc will not burn at all unless the source of heat to which it is exposed be kept up. If a combustible roof be burnt, firebrands must fly about, and it matters not whether they be of wood and charcoal or of zinc. But, laid on iron, it is certain that there is nothing either to set the zinc on fire, or, if on fire, to keep up that which soon goes out of its own accord. Although we prefer for all important roofs still more imperishable materials, we think for the above reasons that pure sheet zinc, in ample thickness, is well worthy the consideration of and much wider employment by the British architect and engineer.

It is highly probable that the existing dangerous lead-covered and timber-framed outer dome of S. Paul's might be removed and a new iron frame to the dome covered over with zinc substituted, for not very much more than the value of the old materials, especially the enormous mass of lead, thickly plastered over with the solderings of six generations. The zinc would keep its beautiful gray tone of colour permanently, and not present the sooty blackness of the existing lead.

We must pass on from zinc, however, to split-slates, now our almost universal roof-covering. So far as durability and staunchness, coupled with a considerable power of resistance to disintegration by fire, go, perhaps no material can excel common slate naturally of good quality. In some of the roofing slate districts of the Continent, as in the Ardennes, about Angers, &c., examples exist of its use dating from the twelfth century, and it is known to have been employed in the preceding century, if not before. Probably no more permanent and safe roof can be devised than one of good Welsh "Ton" slates laid on iron framing, tied on with plaited copper wire, and close rendered with good mortar or cement at the under side.

The incurable defect of split-slate roofing, as applied to buildings of an artistic and important character, however, is the baldness and unimpressive character of its surface. The ingenuity and skill of generations of architects and of slaters have been expended in vain in trying to remedy this. In the slate regions of France and Germany split slating can be seen cut into all sorts of fantastic forms—scale-shaped, scolloped, laid in diagonal courses, laid diamond-ways, and in a hundred other shapes and ways. In our own country and time our architects have tried the combination of different coloured slates, such as of the rich blue Welsh slate with the green of Delabole, &c., but the failure of all these methods to remove the bald monotony of a surface made up of plates so thin and with such splintered and thinned off edges as to refuse to give any relief by shadow, proves that the evil is radical, and no more incongruous or degrading character of roof covering could perhaps be placed upon a grand and ornate Gothic church or cathedral than one of what we call "slating."

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[*] From the *Engineer*.

The most permanent as well as cheapest and simplest roofs in the world have been those of the Greek and Roman architects, composed wholly, like that of the Pantheon, of brick and stone—simply a huge mass of rubble masonry, carried by arch or dome, and externally covered by slabs of stone or flagging.

The early church builders employed this, but soon found out that unless the covering flagging was impermeable to capillary moisture, as well as the joints water-tight, the whole mass of the masonry got gradually saturated with moisture, and ceilings below were injured. The method did well enough, perhaps, for a climate blessed with a long dry season and a fine sun all the year, but the French and German church builders soon found that the case was very different in their climates, and hence they adopted the excellent expedient of separating the covering of flagstones from their arches or groining beneath, by supporting the former on stone purlins laid across and bedded into slender spandrel arches sprung above the groining, so that a free passage for air, and also for examination and repairs, was left between. They also chiselled the flags, hollowing their upper surfaces so as to run the water falling on them rapidly off towards the centre of each width, and giving raised edges, which were covered by stone roll caps, or by other expedients like the old Greek or Roman tiling.

Thus arose those admirable roofs known in France as "*en dallage*," of which one most instructive example to both engineer and architect may be seen in those of the clerestory roofs of Nôtre Dame at Paris. The "dalls" being hand wrought, must have been expensive; but they were, if of good stone—*i.e.*, if not absorbent of water, imperishable. They were wrought exteriorly into various designs, more or less, however, subservient primarily to their use as water-tight coverings, and those combining the finest play of light and shade and repetition of beauty in form, produced, as may be still seen in several cases, the very noblest architectural effects.

That we might still roof our cathedrals without the use of an ounce of metal of any sort no practical constructor probably will deny. Very light spandrel ogival arches in brick and Portland cement, with the extrados filled up to the line of the roof pitch or surface, and crossed at short intervals by purlin bars of sawn Welsh slate, could be covered in at once with sawn slate, "dalls," rolls, and ridge caps.

But with our existing mechanical and other resources we can do still better. We may cover a stiff iron-framed roof with suitably formed "dalls," machine wrought in Welsh or Irish sawn slate, that shall possess all the beauty and character of the ancient examples.

Slate slabs of 5ft. or 6ft. long, by, perhaps, half that in width, of (say) one inch and a half in thickness, could be at a cheap rate hollowed down by revolving cutters, so as to leave the needful raised edges round the sides and ends at whichever surface of the slab required, and raised or incised ornaments might be thus produced at the same time in endless variety on the exposed surfaces. When finished the average weight of the slab would be only about that of an equal surface of (say) three-quarters of an inch to an inch in thickness, and such slabs would remain steady in place in the highest winds by their own weight. We suggest this not only to our architects, but to those interested in our great slate industry, to whom it would rapidly give a new and lucrative branch of trade, for such machine-made slate "dalls," or tiles, as perhaps we might call them, would soon be valued by the architect and builder for the roofs of many other classes of buildings as well as ecclesiastical ones. The colour or tint of slate, whether blue or green, is not liable to much objection, and here we should obtain what slating wants—fine play of surface lights and well cut shadows. The reference to colour, however, suggests to us that in the existing state of our ceramic arts, flat glazed tiles, quite as large as "dall" slabs, could be readily produced by our potters were the demand for some of them once assured. The giving a light—white, gray, or buff—surface colour to large tile slates, such as we refer to, by means of a surface opaque enamel burnt on, has never, we believe, yet been done, and that is still needed to enable a tile-slate roof of great dimensions, to be produced with the full beauty of which it is susceptible.

In Southern Italy, the former kingdom of Naples, and in Sicily, roof coverings of great beauty are seen upon ancient churches and monasteries, formed wholly of parti-coloured glazed tiles—white, black, yellow, blue, brown, &c., laid in various patterns. There, under a brilliant sun, and on a scale not too large, the effect is often very charming. But too much or too bright colours do not suit our dull climate or buildings, nor very large roofs. On buildings of great magnitude, ecclesiastical or not, or in whatever style, in which the roof properly forms an important feature in the general effect, the material of the roof covering will best be of light, but neutral—at least not too boldly pronounced—colour, that shall harmonise with the prevailing tint of the building itself, carrying the eye upwards to the skyline above.

We believe that all the aims, then, structural and æsthetic, of the higher class of roofing, may be fulfilled by wrought-iron framing, covered in with machine-carved slabs of sawn slate, or with those formed and decorated by the improved apparatus and the decorative resources of the potter.

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PROPOSED MUSEUM AND FREE LIBRARY FOR SOUTH LONDON.

SOME time ago a Mr. Clements offered to erect at his own cost a building to serve the purposes of a fine art museum and free library for the East-end of London. In addition, he offered to present 10,000 volumes towards the library, and to place in the museum his valuable collection of pictures (including specimens by Andrea del Sarto, Mantegna, Wynants, and other great masters), coins, MSS., &c. Some difficulties arose in procuring a site for the building, and Mr. Clements' proposal, so far as regarded the East-end, fell to the ground. The recently-opened East London Museum, at Bethnal-green, which is under the management of the South Kensington authorities, having amply supplied the need of that locality in this direction, Mr. Clements has turned his attention to South London, where he proposes, with the help of a local committee, to establish a free library and museum. At a preliminary meeting, held on Friday last at the residence of Mr. Clements, to promote the object, the following resolutions were adopted:—1. "That the providing museums, art galleries, and free libraries for amusement, resort, recreation, and instruction, tends to elevate the moral, social, and intellectual condition of the people, and the various moral and intellectual efforts now being exerted will be helped forward by the establishment of them as places of resort. They are consequently necessary accessories to those efforts, and as they induce a cultivation of a taste for the fine arts, they improve the art manufactures, while the advancing education of the people make them an almost absolute demand." 2. "That, considering the South of London, with its nearly million of inhabitants, ever increasing, has no local museum or free library, it is desirable to establish a South London Museum and Free Library." It was afterwards resolved that the meeting be adjourned until this (Friday) evening, at 8 o'clock, and it was arranged that it should be held at the "Templar Assembly," 104, Westminster-bridge-road.

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THE COST OF THE LATE STRIKE IN THE BUILDING TRADE.

ON Saturday last the "balance-sheet of the carpenters' and joiners' short time movement of 1872" was laid before a meeting of delegates held at the Brown Bear Tavern, Bloomsbury. Appended to the account is a report by the late Central Committee, which states that the "nine hours and ninepence" agitation commenced on the 3rd of February; but the memorial to the employers was not settled until the 1st of March, when it was adopted by a delegation representing about 5,000 society and non-society men. The report, after referring to the rise in the price of the necessaries of life, and enumerating other grounds for the course they pursued, goes on to declare the belief of carpenters and joiners to be "that strikes and lock-outs are evils, and after all but clumsy weapons of offence and defence, and they trust that the day may soon arrive when they will be no longer necessary, and that courts of conciliation may supersede them. Technical knowledge and skill will at no distant period assert its legitimate sway, and with that knowledge will grow the power that will enable the workman to ennoble himself and elevate his trade to its proper position." To hasten the arrival of this "good time coming" it is further remarked, "It would be well if the example of combination set by the masters were imitated by non-society men associating themselves at once in union with their brethren." Besides the 293 men who "struck" at Jackson & Shaw's and Brass's, the maximum number the committee had provided for was "about" 1,800, the former of whom in 14 weeks were paid £1,801 6s. 7d., and the latter in 11 weeks £4,430 12s. 4d.; a sum of £25 15s. 11d. was paid to men who had refused to work overtime, and £7 17s. was expended "in drawing men out," and sending others into the country. The amount distributed amongst Corbett & M'Clymont's men was £117 12s. 4d. making the total strike and lock-out pay £6,583 4s. 2d. The balance was expended in the collection and administration of the gross receipt, the executive, including chairman, treasurer, secretary, auditors, and committeemen taking £592 6s.; printing, £97 10s.; rents, £35; postage and telegrams, £15 9s.; stationery, £8 19s. 5d.; newspapers, £1 6s. 11d.; the total outlay being £7,251 13s. 11d., leaving £1 9s. 2¼d. towards the cost of printing the balance-sheet. The receipts were made up of £3,427 5s. 6¼d. from "firm" subscriptions, £452 19s. 10½d. from "levies," £1,520 4s. 6½d. from Carpenters' and Joiners' Trade Societies, making £5,349 9s. 11¼d. from the trade itself, £548 8s. 11d. from other trades, and £1,304 4s. 3d. from public-house collections, "country friends," and "friends of the movement." The latter includes £86 17s. 9d. the proceeds of two benefits at the Grecian Theatre, upon which there was a net profit of £28 16s. 9d. No clue whatever is afforded as to the amount disbursed by the Carpenters' and Joiners' Societies amongst their members for "dispute pay" whilst the strike continued; but "outside" it is roughly estimated at £1,500, which, added to £7,253, would make the gross cost to the carpenters and joiners £8,753. Add this latter sum again to £2,250, "about" the amount collected and expended by the masons, bricklayers, plasterers, painters, smiths, and labourers, and we get at very nearly the whole cost of the strike and lock-out on the operatives' side—viz., £11,000 odd, of which a very handsome percentage was required for its administration. During the great strike and lock-out of 1859-60, from August to February, the United Trades Conference received £8,198 18s. 7½d. from the provinces, including Ireland and Scotland, for the support of the building operatives and labourers. The London income was £14,874 7s. 10½d.; and the total receipt, £23,065 6s. 6d.

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CROWN LANDS.

THE Commissioner of the Land Revenue of the Crown in England describes in his annual report what was done by him in the management of the hereditary possessions of the Crown in the year ended March 31 last. He granted fifty-nine leases of lands or houses, situated in different counties in England, and not being within the boundaries of any of the royal forests, and also of coal, stone, slate, and minerals. The rents, reserved under these leases, exclusive of royalties, amount altogether to £4,099 12s. 1d. Six leases have been granted of land in Kent, Surrey, Sussex, and York. The total acreage of the land comprised in these leases amounts to 220a. 1r. 8p., and the gross annual rents, reserved under the leases, amount to £359 9s. 5d. Sixteen leases have been granted of nineteen houses and other buildings in London, and at Sudbrook, near Richmond, at rents amounting altogether to £3,003 10s. 8d. Of the class for building twenty-eight leases have been granted of sites for thirty-three houses, and for other buildings, situated for the most part upon estates at Dover, Egham, Eltham, Lee, Richmond, Victoria Park, and Windsor. The ground rents, reserved by leases, amount to £538 6s. Two leases have been granted of slate, stone, and minerals, under reservation in each case of a royalty upon the minerals, &c., that may be raised, with minimum royalties amounting to £25 a year. One lease has been granted of sporting at Esher; one lease of a supply of water to the College of Engineers, at Cooper's Hall, Egham; and five leases of parcels of land for garden and other purposes. The rents, reserved by these leases, amount to £173 6s. Particulars are given of various sales of different premises and hereditaments that it was not advisable for the Crown to retain, or that were required for local or other improvements, &c.; also of different parcels of land now or formerly below high water mark.

The total sum received for this property is £48,090 9s. 9d., subject to the payment to the Ecclesiastical Commissioners of England of one moiety of the sum of £13,750, received from the sale of certain land in the county of Durham. Her Majesty has made free grants of parts of the hereditary possessions of the Crown. The first is that of one rood of land, with the building thereon, for the purposes of a school in the district chapelry of Aldborough Hatch, in the parish of Barking, Essex. More than two-thirds of the district belong to the Crown. The second grant is that of an acre of land, as a site for a church and parsonage, to be called S. Peter's, near Eltham, Kent. More than three-fourths of this district belong to the Crown. The third grant is that of one rood of land, as a site for a school in the parish of Ascott, in the county of Oxford. The Crown is possessed of considerable property in the parish.

CHALLENGE PRIZE OF THE NATIONAL MUSICAL UNION.

WE illustrate this week Mr. Nicholl's design, selected in open competition, for the challenge cup, value £1,000, of the National Musical Union, now being executed for the Crystal Palace Company by Messrs. Cox & Sons, of Southampton-street, Strand. The design consists of a loving cup with cover, supported by a pedestal and platform, all of silver gilt, richly adorned with enamels and jewels, the whole standing over 36in. high. The cup is 10½in. high enriched with *repoussé* work, filigree work, enamels, and engraving—the enamels comprising figures of King David and S. Cecilia. The bowl, 10in. in diameter, is supported on a stem and foot of varied plan, and is pierced with tracery and enriched with jewels. Suitable inscriptions and devices in enamel and engraving both on the cup and stand will commemorate the object of the design. The cover is surmounted by a crown and wreath enamelled, enclosing a shield on which will be engraved the device or title of the society holding the cup, to be permanently suspended in the open arcade, or fixed in one of the panels of the cover at the termination of the holding. The pedestal is 18in. square, comprising a platform surrounded by open tracery and enamelled scrolls, bearing inscriptions, each angle being occupied by canopied niches, with statues of Guido, Aretino, Palestrina, Handel, and Mozart. Eighteen designs were submitted to the judges, Sir M. D. Wyatt and Professor E. J. Poynter, A.R.A., who selected for the first prize that by Mr. S. J. Nicholl, architect; the second premium of £25 being awarded to Mr. Owen Gibson; the design by Mr. W. Wise being highly commended.

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HALL FURNITURE.

THE designs for hall furniture, of which we give an illustration this week, are executed in oak, and French polished, the slab to the stand being in Derby marble. The trays to catch the water from umbrellas are lined with galvanised iron, made moveable. The object of the designer appears to have been to produce massive furniture, not liable to hold the dust, thus forming a contrast with the more ornate furniture of the rooms. In this, we think, he has succeeded. One novelty is the introduction of many panels, which are filled with the author's own handiwork, he not merely having made the designs, but also executed the work. This sunk work is protected by plate-glass, stopped in with moulded stops. The drawings being in elevation, and a scale given, the dimensions can be taken. Mr. Banister Fletcher is the architect.

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SANITARY CONDITION OF S. PANCRAS.

THE local authorities of S. Pancras have presented to the Metropolitan Board of Works an elaborate report, showing the amount of sanitary work effected in the district since the Metropolis Local Management Act came into force in 1856. The local government of S. Pancras prior to 1856 was exceptional. Jurisdiction over the streets and houses was divided between eighteen separate and distinct Boards of Commissioners, each board performing its duties under a separate Act of Parliament, the provisions of the several Acts being different and in some cases conflicting. There were two other districts that had been built up and inhabited for years without any Board or public body having any control or jurisdiction over them. These were the S. Jude's district, lying between Gray's Inn-road and Bagnigge-wells road, now King's-cross-road; and the district known as "Agar Town." In these districts the roads were unmade, the footways unpaved; in wet weather the roads were deep in mud and impassable, and in dry weather they were inches deep in dust. The roads were, of course, never watered or cleansed. The more valuable portions of the contents of the dust heaps—dustbins being scarce—were collected by "flying dustmen," and the worthless portions—the most offensive and perishable—were thrown into the roadway to add to the filth already there. Moreover, there were no lamps. In another division of the parish the "Holmes estate"- the powers of the Commissioners under an Act of Parliament had been allowed to lapse, and the district was in a condition almost as bad as those above described. In the northern part of the parish there was another district where some miles of streets had been built up outside of the recognised limits of any paving Boards, where the roads were unmade, unlighted, and neglected. All these districts, on the consolidation of the Local Government, were reduced to order and cleanliness. The total amount expended in sewerage, paving, and other improvements since 1856 has been £884,774, exclusive of payments to the Metropolitan Board. Various regulations existed previous to 1856 in different parts of the parish regarding the inspection of the houses of the poor, but in many parts no regulations existed. Courts, alleys, and dwellings are now thoroughly inspected by a large staff of officers; and from 8,000 to 10,000 visits are made annually. While, however, S. Pancras will now bear comparison with the districts around it, and with London as a whole, it has had special difficulties to contend with. Three of the largest systems of railway in the country—the Midland, the London and North-Western, and the Great Northern—have their principal passenger and goods termini in S. Pancras, and the demolition of houses for these and other railways has tended greatly to aggravate overcrowding and to increase the number of poor *employés* in the parish. There are several difficulties in addition to these, over which the local authorities state they have no control. Pauperism has increased both relatively and absolutely to the population, and as compared with the metropolis as a whole; nevertheless, the district in its sanitary and general condition offers a more favourable comparison with its state in and before 1856.

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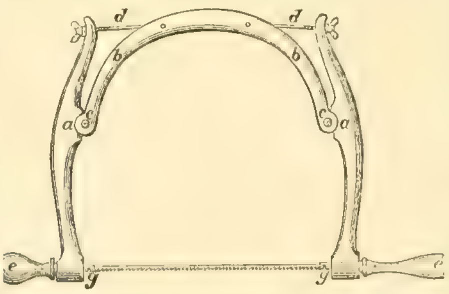
COTTER'S BOW SAW.

THE improvements claimed in this invention are the introduction of a curvilinear stretcher of bent wood; a new method of affixing or removing the saw blade; a means whereby different lengths of blades may be used in the same frame; a new form of handle, with tension ferrules attached thereto; also a method of keeping the handles at right angles with frame, whatever length of blade be used. Reference to the accompanying engraving will fully explain the means of obtaining the results named: *a* shows the armatures, and *b* the improved stretcher, attached by knuckle joints to the armatures. Passing through the upper ends of armatures are tension rods *d*, with thumb nuts at their outer ends, passing into female screws cut in the ends of a small iron tube passing through the stretcher *b*, by this arrangement the tension may be regulated to the greatest nicety. The saw blade is held in the handle *c*, furnished with a spindle *f*, and sliding collar *g*; the ends of saw blade with fixed pins entering into transverse and longitudinal slots in the spindle are there fixed and locked by the sliding collar, which is provided with corresponding slots. One of the spindles is shown in section, passing through and working in revolving metal bearing *j*, in the lower ends of armatures, and further provided with ferrules, *h*, cut with female screws; this gives a further power of adjusting the tension on the saw blade, and of using blades of different lengths. The spindles are fixed in position by set screws *i*, as also are the revolving bearings by similar set screws at the back of armatures. The advantages of this invention are as follows:—Its capability of embracing more than double the width of surface than with the straight stretcher frame, thereby obviating the use of keyhole or pad-saw, in numerous instances where the old bow saw necessitates their use; the impossibility of fracture from over tension; the rapidity with which the blade may be fixed or removed; and accidental detachment is entirely obviated. The weight of frame may be varied according to the character of work, extremely light for fret or small cabinet-work, while for such as heavy chair work they may be made correspondingly strong, and at a price but little in advance of the old form of frame.



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S. ANDREW'S CHURCH, HOLBORN.

THIS church, after being closed for some months, was reopened for worship on Sunday, October the 15th. The old church tower is supposed to have been erected about the year 1470. The Great Fire of London destroyed the entire structure, with the exception of the tower. When Sir Christopher Wren rebuilt the church he, instead of removing the old tower, enclosed it in an outer casing of the same style as the church. The structural improvements lately carried out may be briefly enumerated as follows:—The old tower, which was separated from the nave of the church by a screen wall with gallery in front, has been thrown open to the nave by the removal of the said wall and gallery; the Gothic arch thus thrown open now unites the nave with the tower. A ritual chancel has been formed at the east end, the floor level of which has been raised 2ft. above floor line of nave, and choir stalls have been arranged north and south of same. The old high-backed square pewing has been removed, and substituted by new low oak seating. A new organ has been constructed, which, spanning over the Gothic arch before alluded to, rests upon the galleries each side, occupying the entire width from gallery to gallery, and from the height of gallery book rails up to highest point of ceiling line. The old windows have been removed, and new iron ones substituted, glazed with tinted cathedral glass. The pulpit (originally standing at south side of chancel) has now been fixed on the north side. It is richly carved, and believed to be the work of Grindling Gibbons. It formerly rested upon an oak pillar, but has now been placed upon a pedestal of Ketton stone, with twelve columns of serpentine marble, the upper portion bearing four figures of S. Andrew, S. Peter, S. James, and S. John. New and powerful sunlights have taken the place of the old gas arrangement; the church has been heated by a system of hot-water pipes. A new clock, with Westminster chimes, has been erected in the tower. Besides these structural alterations the church has undergone a complete repair and decoration. The nave ceiling and groined ceilings of galleries are in panels of a tempered torquoise blue hue, as ground colour, with margins in stone vellum and the enrichments in white; the blue grounds are filled with a Classic diaper in self-colouring and white. The walls are a neutral of silver gray; around each window is painted a Classic architrave pattern. The shafts of columns are finished in Indian red, with a suitable self-coloured stencil; the caps have a background of green, and the Corinthian enrichments are in white heavily etched in gold, while above the base and below the cap upon each shaft an arrangement of bands in gold and colours is executed. The spandrels over columns are in stone vellum, the heavy enrichments being treated in white, the cherubims' heads solidly gilded. The chancel ceiling is treated uniformly with that of the nave, with the exception that the enrichments to panels are gilded. The paintings at east end have been carefully restored, and the columns to the windows in the centre treated in gold and subdued colours upon a stone vellum ground. The panelling at each side of chancel has been treated in colours and gold in suitable diaper ornamentation. The oak work and panelling of chancel have been finished in gold, the panel surface filled with illuminated texts, the carving to frieze being solidly gilded upon a background of crimson. The portion of old work immediately above the communion table has been designed and treated to form reredos, rich in colouring and gilding, the old altar table under finished in gold. The oak case of organ is stained and varnished, and the pipes artistically treated in seven different designs, in gold, alternately outlined in crimson and blue upon the metal. The general oak work, including the new seating, has been stained and varnished. The entire restoration has been executed from the designs of S. S. Teulon, Esq., architect, of Craig's-court, Charing-cross, and under the superintendence of his surveying clerk, Mr. J. Burford; the structural repairs and alterations by Messrs. Patman & Fotheringham, contractors, of Theobald's-road; the new oak seating by Mr. Chapman, of Hanworth, near Norwich; the tile work by Mr. McColla, of Parliament-street; and the artistic decorations to both church and organ by the Messrs. Phillips & Son, of Baker-street, Portman-square. The organ is by Messrs. Hill, of Camden-town; the new stained-glass windows in tower by Messrs. Heaton, Butler & Bayne; the new clock by Messrs. Thwaites & Reed, of Clerkenwell; the new glazing by Mr. Odell, of Bath-street, City-road.

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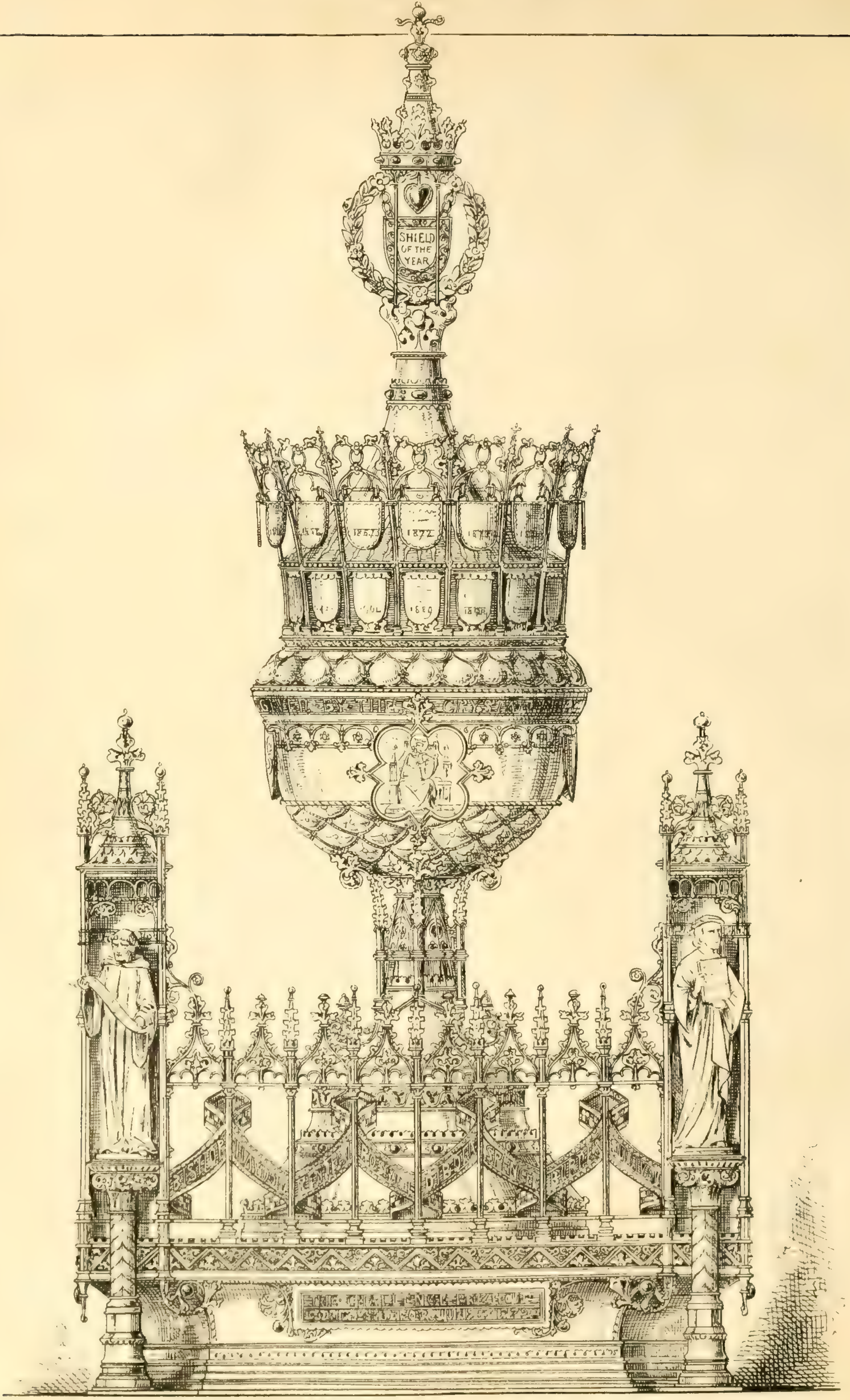
The Commissioners of Works have caused to be erected in Hyde Park a granite pedestal and iron standard, surmounted by a board, to mark the spot where it shall be lawful to hold public meetings.

It is stated that in Dublin more than 70,000,000 gallons of water are wasted daily, yet the Corporation is obliged to refuse to supply water to manufacturers.

It is said that Mr. James Gordon Bennett is about to erect over the grave of his father, the founder of the *New York Herald*, a monument, at a cost of 250,000 dollars (£50,000). It will be the most expensive, if not the finest, thing of the kind in America.

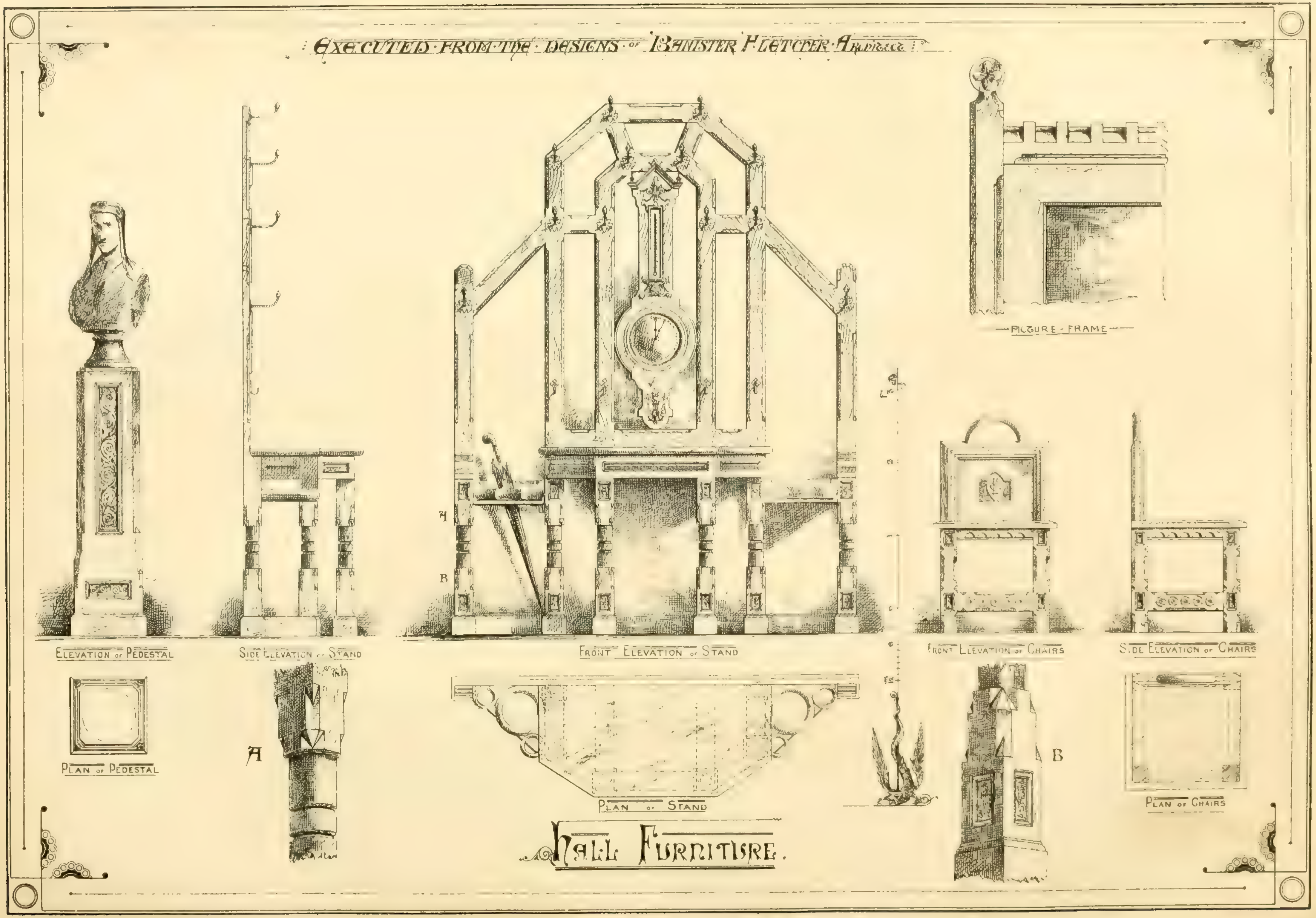


CHALLENGE PRIZE OF THE NATIONAL MUSICAL UNION VALUE £ 1000

DESIGNED BY S. J. NICHOLL ARCH

AND EXECUTED FOR THE CRYSTAL PALACE C° BY MESS.RS COX & SON, SOUTHAMPTON S STRAND, LONDON

Executed from the Designs of Banister Fletcher Architect



Hall Furniture.

JOINT-ACTION.—A FABLE.

[BY AN OCCASIONAL CONTRIBUTOR.]

IN a society of young men banded together with one common object—to promote their mutual advancement in a profession to which they one and all belonged, and with, perhaps, a certain secondary motive, to further, by means of the association they had thus united to form, their own individual interests (we need not here name the society, or specify the nature of their profession), there once upon a time arose a perilous movement. This society was, from the very nature of it, of an educational character; its members were avowedly anxious to improve themselves to the best of their ability, and in so doing they had, of course, no objection to improve their fellow creatures. They were not, and, in fact, did not pretend to be, at the time they enrolled themselves members, of any very high rank in the profession they were destined ultimately to adorn, and as in this world of ours all progress towards the Temple of Fame is very slow and tedious, they naturally availed themselves willingly of any extraneous aids to raise themselves in the esteem of their brethren, and to improve their position in life.

Now there was at the time we speak of another society in existence, which included among its members what we may term the elder men of the profession. It would be extremely difficult to define tersely, except by negatives, what were the exact aims and objects of this other society. It was not an educational body; it did not grant diplomas; it did not exist in order to promote good fellowship among men of a like profession; it had no recognised authority, and no definite code of laws binding upon all its members. It was true it had a large income, which income it expended in various laudable ways—in Consols; in a yearly gathering of its members and non-members to talk over any matter to which any one was charitable enough to draw its attention; in the formation of a library which nobody used, and in tea and coffee. It lived, or rather escaped death, by a series of convulsive annual efforts to obtain papers which were brought forward for discussion at its meetings, and its greatest successes were based upon the mutual admiration principle, as developed by a few of its leading professors. But beyond these vast inducements to enter its ranks, there were still other advantages to be gained by membership therein. Those who had duly, after seven years of active professional work, rendered themselves worthy of its honours, acquired on joining the privilege, so invaluable upon their door-plates, of appending to their names no less than five letters of the alphabet.

In an age when titles and distinctions were estimated chiefly by their length, or rather by the number of letters in which they were expressed, such an alphabetical train as this was indeed worth paying for, and thus we may probably account for the wealth of this learned body.

In order, however, fully to explain the movement to which we have already referred, it will be necessary to examine the action of the profession as indicated by the previous operations of this society. Some years prior to the events we are about to deal with, it had been found desirable to erect a lumber-room in which to deposit the various collections which had from time to time accumulated in the hands of certain representatives of the profession. The objects comprised therein were of a very miscellaneous character, and had occasioned no end of trouble and difficulty to those who were in charge of them. There were too many things to bury—they would not burn, the dustmen would not take them away; they had as a last hope been offered to Government, but even the great National Museum, which took anything that was offered to it, refused to keep them beyond a certain time, and the custodians were at their wits' ends to know what to do with them. Strangely enough, there was at the very time we mention a roomy building in a central position admirably suited to contain these collections, had they been worth the trouble of preserving, but then it was felt that this building was too valuable and too well situated to be turned into a lumber room, so a piece of ground which was useless for any other purpose, except, perhaps, as a site for a rag-and-bone shop, was selected in a back slum, in an out-of-the-way neighbourhood, and a gratuitously-designed building was erected thereon by a philanthropic contractor, who undertook to trust to Providence for payment. (We may add, for the information of our readers, that builders of this class were at that time rare.) This building having, after great exertions, been roofed in, the objects were hurriedly deposited in it; the arrangement of them having been entrusted to the carmen who brought them. A committee of management, comprising among its members some of the greatest names in the country, was appointed, and if the so-called museum had only had a staircase and a few other little conveniences, everything would have been perfect.

Having thus endeavoured briefly to describe the position of matters at the period under review, we may now proceed to notice the events we have undertaken to narrate. The junior society, if we may so term the body of younger men, had for years been crying out for more recognition from their seniors—for examination, for instruction, for all sorts of things which they had not got, and were no more likely to get than the child who cries for the moon. We are wrong, by the bye, in one respect, in saying that they had got none of these advantages, for at great trouble and expense their elders had most condescendingly put some twenty of the younger men through their facings on matters which had but very small bearing upon professional work, and a voluntary examination had become an annual institution. But as this examination conferred no advantages upon any one, led nowhere, and resulted in nothing, the examiners had very light work of it. By dint of agitation, however, and as the reward of long-continued clamour, a few malcontents persuaded themselves and their seniors that the one thing wanted was a genuine professional education, and in a fatal moment it occurred to some gifted individual that the only way to obtain this boon was by means of what was termed joint-action. Every one was to lend a hand in his own particular branch, and the great want of the day was to be supplied. The seniors were to find money and encouragement; the juniors, undeveloped talent and yearning for the wisdom of the aged, and even the authorities at the lumber-room could lend a hand, with all their store of treasures, big names, and floor space with a roof over it.

Well, nothing would do but to form a Joint-Committee, and get in subscriptions, in order to set to work, and with the vast energy thrown into the new movement, this was very soon accomplished. The money being in hand, and the shoals of ardent youths doubtless thirsting for instruction, the first thing, of course, to do was to make a staircase, and explore the upper regions of the storehouse in which they were to be taught. The Committee soon managed, by the help again of the too-confiding contractor, to remedy the little omission of the way to get up, and they then found themselves landed in the top gallery, with no gas, no heating, and no partitions. These were trifles soon overcome, and everything being ready, classes were started for teaching all sorts of pretty accomplishments, and the great collections which the building contained were now at last to be utilised, but, to the amazement of everybody, there was no one to be taught! The Committee met, and argued, and shrugged their shoulders; the storehouse people who had found a use for their collections, and obtained a way up to them, acted on the "rest and be thankful" principle, and the older men gave up the whole matter as a bad job, forgetting even to send in their share of the expense of the staircase after the first year; while the younger men, who had been so eager to be taught, learnt only one lesson, *the folly of joint-action.*

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THE ADVANTAGES OF BUILDING WITH CONCRETE.

A CORRESPONDENT, who signs himself "Khoda Bux," gives the following, with other information, in the *English Mechanic and World of Science*, on concrete building:—On the subject of concrete (he says) I may say that I have now nearly finished my operations in concrete, save and except a stone staircase from the cellar to the first floor, the framing of which I am now making, and a few other miscellaneous articles, such as sinks, small cisterns, &c. Of large cisterns I have made one, to collect the rainfall of nearly 5,000 superficial feet of roofing, of the following dimensions: Depth 10ft. (of which six and a half are below the ground surface), length 13ft., breadth 6ft.; and another to collect the rainfall of 3,100ft. of roofing, size about 6ft. × 10ft. × 10ft. As the situation of these tanks is considerably higher than either the kitchen or flower gardens, I calculate, by aid of two or three tons of gas-piping, which I laid in cheap before the rise in the price of iron, to be enabled to water all my garden ground, by gravitation, with hydrants at all convenient places. Reckoning on saving not less than 27in. of rainfall out of the annual average of 33in., I reckon on storing about 120,000 gallons. I have also been constructing several cesspools and liquid manure tanks, of various sizes, 9ft. deep. I do not go deeper, because below that depth I get into a running sand, which would require tubbing. In making these underground tanks, I kill two birds with one stone. I save all liquid refuse, and get my gravel for garden walks cheap. I pay 6d. a yard for excavation down to 9ft., a tank 9ft. × 9ft. × 15ft. = 45 cubic yards, costing, in excavation, about £1 2s. 6d., out of this I get not less than 30 yards of first-class binding gravel, which, had I to lead from another part of the property, would cost me not less than 20d. a yard. From the tanks thus dug, I barrow the gravel, when required, any distance not exceeding 100 yards, beyond which distance I cart it. The gravel I value at £2 10s., leaving me about £1 7s. 6d. towards paying the cost of concreting. . . I shall now trespass upon the patience of your readers by giving a little of the *how*. As I have mentioned in my former letters, I started with Portland cement as the agglutinative material for keeping my gravel, sand, and flint stones together; nothing could have been nor could anything be more satisfactory than the result in work, but as there is an old saying "that there are always as good fish to be found in the sea as ever came out of it," so in any invention on the uses of any material in general request the brains of the thinking man are always discovering some new substitute, either better, equally good, or cheaper. Now, in the case of concrete, General Scott has discovered a mode of binding the raw material which cannot be better, but certainly is cheaper than Portland cement, and, as far as I can see up to the present time in my experiments with 15 tons of selenitic lime and 10 tons of selenitic clay, one quite sufficient for all ordinary work in walls. The General, in fact, makes his cement at the time of mixing in the place of mixing the ingredients first, and then burning and grinding. His mortar, save and except in the addition of either sulphuric acid or plaster of Paris, is the same as I have been using in India for many years—viz, one composed of lime and the half-burnt bricks powdered into dust. I had heard in the early part of 1871 of what General Scott was doing, and in the Exhibition of that year I saw on one of the stalls the briquettes made of his mixture, and their high powers of resisting tension and compression. I was, however, at that time too much in love with my Portland cement to think of anything else, or to think of that most material question—cost. In March last I read in the *English Mechanic* an account of the selenitic mortar; early in May I was able to procure some, and since that time I have been making a variety of experiments. One of the first experiments I made was as to its waterproofing qualities. Finding that my concrete roofs made of Portland cement, although drop proof were not damp proof, I commenced immediately after finishing a roof with Portland cement concrete to give it a good coating of selenitic mortar, made of a mixture of one part selenitic lime to two of selenitic clay, mixed together in the mode prescribed by the Selenitic Mortar Company. To each volume of the mixture I gave four to five volumes of sharp clean washed sand. Working all this together I applied it in a semi-liquid state to the roof, working it hard into the roof with the stub of a well-worn birch broom. After this had got tolerably well set I had the roof floated and set with fine stuff, with finer sand. The roofs treated with this have shown as yet no sign of damp. What effect frost may have on it is yet to be seen. I have also used a considerable quantity of the selenitic lime for inside plastering, and I can safely endorse every word in its favour mentioned in the circulars of the Selenitic Company with regard to plastering.

I now come to concreting. Although but little is said in the circular referred to, on a visit I made to the office of the company in the Belvidere-road, Lambeth, I saw a block of concrete, stated to be formed of the following materials:—Selenitic lime 1 part, selenitic clay 4 parts, sand 5 parts, gravel 40 parts; or, in other words, 1 of the mixture of selenitic lime and clay to 9 parts of aggregates. Not altogether liking the large quantities of aggregates in proportion to the lime and clay, I commenced walling with only 6 parts gravel and sand to 1 of lime. Being by no means satisfied with the result, I tried the admixture of 9 parts to 1, and was agreeably surprised to find the result better. If I am right in my conjectures, the better result in the larger quantity of aggregates was owing to the power of adhesion in the selenitic lime being greater than its power of cohesion; consequently, the greater quantity of aggregate made the concrete stronger. In an economical point of view this is important. By a mixture of aggregates the Portland cement is rapidly reduced in strength by reason of its power of cohesion being stronger than that of adhesion. I have erected about 12,000 cubic feet of outside walling with the selenitic mixture, in proportions of 9 to 1, and am patiently waiting for its behaviour under frost in the coming winter. At the present moment I am making an experiment with a composition of selenitic lime, selenitic clay, and Portland cement in equal quantities, 1 part of the mixture to 9 parts of aggregates. Of this mixture I am building five pigstyes, 8ft. by 14ft. each. Of this mixture I have put into work up to date about 300 cubic feet during the last week, and its behaviour is to me very satisfactory, and I believe fully equal to Portland cement alone in equal quantities. If I live until next spring you shall have the result.

I see many of your contributors are anxious to dabble in concrete, and build cheap and warm domiciles for themselves. I will give them the cost of materials for walling of each of the mixtures.

Cement Alone.

	s.	d.
Cement, 3 bushels, at 2s. 3d.	6	9
Gravel, 36 cubic feet, at 1d.	3	0
40	9	9

Result in solid, 26 feet at 4·5d. per cubic foot.

Cement, Lime, and Clay.

	s.	d.
1 bushel of cement	2	3
1 bushel of lime	1	0½
1 bushel of clay	1	0½
36 feet of gravel	3	0
	7	4

Result 26 feet at 3·4d. per cubic foot.

Selenitic Lime and Clay.

	s.	d.
1 bushel of lime	1	0½
2 bushels of clay	2	1
36 feet of gravel	3	0
	6	1½

Result 26 feet at 2·8d.

From the above it will be seen what a vast saving the use of selenitic lime and clay effects. The only doubt is, what will be the effect of frost. This, I think, may be met by covering all walls exposed to the weather with a slight coating of plaster formed of Portland cement, selenitic lime, and clay. The only other drawbacks to the selenitic mortar is the increased cost of labour in mixing, amounting to about ·40 per foot cube, and the increased vigilance on the part of the employer required to get the materials properly mixed. The moment the employer's back is turned, the workman, instead of gradually mixing, first the lime, then the clay, and then the sand, will bundle in all together, the result being a blow-up of lime and a blow-up on part of the master. I send the above account of what I have been doing in concrete in monolithic building, in hopes that it may be of service to some of your numerous readers. After two years and six months' experience, in which not less than 100,000ft. of solid concrete has been laid, notwithstanding the difficulties of contending with obstinate labourers, prejudiced mechanics, and the proper manipulation of a comparatively new material, I have come to the conclusion that monolithic buildings in concrete, whether the cementing material be some preparation of dolomitic limestone, the excellent selenitic mortar of General Scott, or the still better Portland cement, must sooner or later supersede stone, brick, mortar, slate, and timber, not only in economy of first cost and absence of constantly recurring expenses in repairs, but in superior comfort, less danger from fire, absence of dust, and in the affording of means of well-regulated ventilation. The great drawback to concrete work is the great outlay in the first instance in the cost of framing and iron bolts. In my case the large quantity of work done has reduced that cost to about ½d. per cube foot, and I have my iron work deteriorated about 15 per cent., and my framing about 50 per cent. Were I to commence again, I could, with my present experience, simplify my framing, and reduce the cost most materially by using less iron, no zinc, and more wood. I also think that in walling not less than a foot in thickness a greater proportion of aggregates to cement than 9 to 1 might advantageously be employed without any risk.

Had I done what I have done in brickwork, I should have required not less than 1½ million of bricks, and had to cart them four miles. My bricks alone would have cost about £2,300, exclusive of lime and sand, the lime alone, in my neighbourhood, costing six-sevenths of the price (until lately) I paid for cement; as it is, cement, and gravel, and sand have together come to about £1,900. I could not, in my neighbourhood, have built at less than £11 the rod of 306 cubic feet, which would have made the cost about £3,700. As near as I can make out, my concreting, including better material for floors and roofs, and labour, has come to about £2,500, to which I must add £250, the cost of framing bolts, &c. It will be seen I have thus made a saving of about 30 per cent. If I have made blunders, I have paid the penalty of paying for my own blunders, not for those of architect or builder. As population increases, house accommodation must be had, and as any ordinary labourer with common sense may learn how to mix and lay concrete, and thus make his own nest, I look to building in concrete as the only means of checking the ever-recurring increased demands of bricklayer, plasterer, and joiner. As an earnest of my desire to push concrete, I have offered to several of my best labourers that if they will buy or get a small piece of land, say 30 to 40 rods, and build with their own hands a house, I will lend them the frames and bolts, and lend them the money sufficient to pay for cement, gravel, doors, windows, and grates, at 4 per cent., payable by weekly instalments covering principal and interest, so as to pay off in about 11 years. I calculate that a man with his own labour and that of his sons would be able to build a good five-roomed cottage for about £45 to £50, which sum of money, at 4 per cent interest, on payment of two shillings a week, would be paid off in about 11 years. On this principle a man paying something less than his present rental would become his own freeholder.

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SCHOOLS OF ART.

Hull.—The annual distribution of prizes in connection with the Hull School of Art took place on Tuesday week. From the report of the art master, Mr. E. Chandler, it appears that the total number of students during the year has been 258, of whom 33 attended the ladies' morning class, 75 attended the ladies' afternoon class, and 122 attended the male night class. The recently-established night class for ladies promises to prove a success. Last year the Department of Science and Art forwarded to the school, on the recommendation of Mr. Eyre Crowe, the Art Inspector, a case of objects on loan, intended to assist the students in the formation of still life groups. This has proved a valuable acquisition. Of the students and others who presented themselves for examination in May last, 65 succeeded in passing in 79 subjects, 20 receiving prizes for excellence, of whom 17 were students of this school. In the last national competition the school gained one Queen's prize and nine third-grade prizes.

Leeds.—The third annual exhibition of students' drawings in connection with the Leeds School of Art and Science was opened on Monday. The art specimens exhibited number upwards of 100, and are the work of nearly fifty students. Forty-two members of the classes competed for honours at South Kensington, and of that number fifteen obtained third-grade prizes from the Government inspectors.

Stafford.—A public meeting was held at Stafford on Wednesday week, under the presidency of the mayor, to forward an attempt now being made to establish a school of art in that town. There was a good attendance, and a committee and secretary were appointed to develope the project.

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CHIPS.

The Sheffield Town Council have entered into a contract with the Town Manure Company for the disposal of the sewage for twenty-one years. The company has given security for £20,000.

The parish church of S. Asaph has been reopened, after restoration by Sir Gilbert Scott at a cost of £2,000.

On Wednesday week, the first stone of the retaining walls for the new railway station at Preston was laid. The plans are by Mr. Axon, the companies' engineer. The contractors are Messrs. Banks, Thornton, & Garside.

The foundation stone of a new Wesleyan Chapel has been laid at Shrewsbury. The building will cost £700. Mr. Ingman is the architect, and Mr. R. Smith the builder.

The new Christ Church Schools, Compton, near Leek, Staffordshire, have been reopened, after enlargement at a cost of £800. Mr. Edgar, of London, is the architect, and Mr. J. G. Smith, of Leek, the builder.

A new National School has been opened at Thurnham, Kent. The cost is £1,100. Mr. Bulmer is the architect, and Mr. Abnett the builder.

The foundation stone of a new Mission Chapel was laid at Smethwick, near Birmingham, on Monday. The building is to be of brick, 42ft. by 22ft., with an open timbered roof. Messrs. Bidlake & Fleeming, of Wolverhampton, are the architects, and Mr. Bennett, of The Lozells, the builder.

The foundation stone of a new Methodist School Chapel was laid at Handsworth, on Monday. The chapel will seat 400 people, and the cost will be £800. Mr. D. Smith is the architect, and Mr. Couch the builder.

A [illegible] of oak, walnut, and stone, designed by Mr. S. S. [illegible], has been presented to Trinity Church, [illegible].

Building Intelligence.

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CHURCHES AND CHAPELS.

Bishophill.—The foundation stone of the new church of S. Clement, Bishophill, was laid on Wednesday week. The principal dimensions of the church, which will consist of a nave and aisles, will be, nave 72ft. in length by 28ft. in width; and the aisles will be of similar length and 10ft. wide. The chancel is intended to equal in width the nave, and will be 30ft. long, with an apsidal termination. The building will seat 576 persons. The extreme height of the structure will be 52ft., and it will be furnished with a bell tower. The architects are Messrs. Atkinson, Micklegate, York.

Bixted.—The new church at Highurst Wood, near Bixted, has been opened. The building has been erected by Mr. C. Lulham, of Uckfield, from designs by Mr. Christian, of London. The stone of which the church is composed was excavated from a quarry 500 yards from the spot. The church consists of a nave terminating in a semi-circular apse with a side aisle on the north for children, is built in the old English style, and is of a simple character. The roof is supported by stained wood rafters, that of the apse being domed, and the spaces decorated. The building accommodates 260 adults and children. The total cost of the erection is about £3,000.

Brighton.—The building of a church at Brighton, on the London-road, has just been commenced for the Rev. A. D. Wagner, from designs by Mr. G. Somers Clarke, architect. The builder is Mr. Jabez Reynolds, of Brighton.

Brighton.—A large church is in course of erection in Ann-street, Brighton, of the following dimensions:—Height from pavement to spring of roof 90ft.; from pavement to ridge of roof, 135ft.; width of nave, 46ft. There are eight bays to the church, and the whole length of the building when the chancel is built will be 225ft., so that it may be calculated to seat an immense congregation. The walls are of brickwork, with moulded brick arches and stone bands. The architect is Mr. E. Scott; the builders, Messrs. Stenning, of Brighton. It is proposed to complete the church in about two years from the time the memorial stone was laid, the 2nd of February last.

Duntisbourne Abbotts.—The church of S. Peter, Duntisbourne Abbotts, has been reopened for divine service, after restoration. The church is a small stone building in the Early English style, and consists of a tower, with nave, chancel, and porch. Messrs. Waller & Son, of Gloucester, have carried out the restoration. The south wall has been taken down, and a new aisle and organ chamber erected. The east wall of the nave has also been taken down, and there has also been erected a new chancel arch. New floors have been laid, with benches of varnished pitch-pine. The chancel and altar floor is laid with Godwin's tiles. The porch has been rebuilt. The old roofs of the nave and north aisle and chancel have been generally restored, and strengthened with new timbers. The tower and the walls of the north aisle have also been restored and pointed. The cost has been about £1,000. The works have been executed by Mr. A. Estcourt, of Gloucester.

Elstead.—The church of S. James, Elstead, has been reopened, after restoration, at a cost of £100. A south aisle has been built, a vestry added, and the interior thoroughly restored. Mr. B. Garling, of Southborough Hall, near Tunbridge Wells, was the architect, and Mr. Pink, of Milford, the builder.

Enniskean. On Sunday week the new (Roman) Catholic Church of the Immaculate Conception, Enniskean, was dedicated. It is in the Early Gothic style, and consists of nave, transepts, chancel, Lady Chapel, and square tower, which will eventually be surmounted by a spire. The material used is a gray sandstone of the district. The length of the church is 110ft., the width across the transepts 61ft., the pitch of the roof 56ft., and the height of the tower and spire will be equal to the length of the church. The tower stands in the angle of the southern transept and nave; and in the base of the tower is one of the principal doorways. The tympanum of the doorway displays a bas-relief of the Immaculate Conception. Around the walls of the Lady Chapel, at the height of the windows, runs an arcade in Portland stone, supported upon shafts of native red marble, with carved capitals, and above the altar is a niche which will be occupied by a statue of S. Joseph, 7ft. in height. Throughout the church a number of carvings are distributed. All these, as well as the carvings over the exteriors of the doorways already mentioned, have been executed by Mr. O'Reilly, of Anglesea-street, Cork. The architect is Mr. Richard Evans, of Cork.

Everton.—The foundation stone of a new Primitive Methodist Chapel was laid on Monday at Everton, near Liverpool. It will be in the Romanesque style, will be 60ft. long by 44ft. wide, and will have side and front galleries, class-rooms, and vestry. The exterior will be of brick, with Stourton stone dressings. The architect is Mr. Richard Owens, Breck-road; and the contractors, Messrs. Nicholson & Ayre, Wellington-road, Liverpool.

Font at Studland Church, Dorset.—Three of the principal workmen at the pottery works of Mr. Jennings, of Parkstone—Messrs. Dore, Young, and Knight—in the course of last summer paid a visit to Studland Church, Dorset, then in process of restoration, when the thought occurred to them that they would replace the covering of the font, which was very old and much decayed, being made of wood, by one more appropriate in terra cotta. They accordingly prepared an appropriate design, in perfect keeping with the architecture of the church, which is pure Norman, and of a very early date. The font is most primitive and ancient, being simply a basin hollowed out of a huge block of stone, without ornament or inscription of any kind, and in all probability is more ancient than the church itself.

Hastings.—A committee has been formed to consider what steps should be taken for the restoration of S. Clement's Church. A meeting was held on Friday, October 18th, when it was resolved, notwithstanding some present being in favour of a partial restoration under a local architect, that a sub-committee appointed should consult Mr. Butterfield as to the estimate for a complete restoration, and report thereon to a future meeting of the committee. The rector announced his intention of giving £500 towards the required outlay. S. Clement's Church is thus described by Lower:—"It is a rude, weather-beaten structure, of chancel, nave with aisles, and a west embattled tower of singular architecture. The abbot of Fécamp had licence, in 1286, to build a church of S. Clement in Hastings, *de novo*, the older structure on lower ground having been destroyed by sea. The present building, however, is certainly of much later date."

Heene, Sussex.—On Thursday the foundation stone of a new church about to be erected in the parish of Heene, near Worthing, was laid on the site of the old church. The building will be Gothic in style, faced with flint on the outside, and cased with brick on the inside. The west wall is so built that it can be taken down at any time to enlarge the church. Sittings are provided for 350 people. The size of the nave is 49ft. in the clear; the chancel will be about 32ft. The chancel arch will be of red moulded brick, and all the arches will be of the same material, moulded by special design. The inner moulding will be in chalk. The pews will be stained and polished, with sloping backs. The windows, with dressings, and the columns, will be in Bath stone. The chancel will have a fancy cresting, with slate roof, the timber being stained and varnished. The architect is Mr. E. E. Scott, of Brighton, and the builders Messrs. Nash & Co., the cost being about £2,000.

Lapworth.—The parish church of Lapworth was reopened on Wednesday week, after restoration by Mr. G. E. Street, R.A., at a cost of £1,600. To ensure the safety of arches and pillars, the foundations having become insecure, a large amount of underpinning has been necessary. All the columns and their bases have been carefully made good. The walls have been denuded of plaster. In the north wall of the nave, above the easternmost arch, a very curious and interesting light has thus been exposed, which bears the strongest marks of dating from Saxon times, when this was the external wall of a church without aisles. In the south aisle have been opened out two leper windows; and two other windows, remains of a much earlier church, together with a piscina and its credence table in unusually complete preservation. From the west end of the nave a gallery has been taken away, which has hitherto entirely blocked up two noble lancet windows of the Early English period. A new chapel has been added, leading to the tower from the north aisle, by which additional accommodation has been provided in lieu of that lost by removal of the gallery. The stripping away of a lath-and-plaster ceiling from the nave has discovered a fine old oak roof, which is now laid open. The pews have been removed, and replaced by open sittings. The building has been enriched by the addition of four new stained glass windows. At the west end of the church is a porch, with a curiously interesting chantry over it, dating from the middle of the fourteenth century. This porch was bricked up on the one side and closed by a door on the other, and used as a sort of lumber room. It has been thrown open, and reveals some graceful groining.

Lincoln.—On the 5th inst., the recently-erected chapel of the Training College for Schoolmistresses at Lincoln was opened by the bishop of the diocese. The chapel, from the designs of Mr. A. Blomfield, is a very pleasing little building in the Early English style, in red brick with stone dressings. The east end, with a triple lancet, adorned with shafts of serpentine, is peculiarly dignified. The internal arrangements are very satisfactory.

Liverpool.—The Westminster Congregational Church, Kirkdale, Liverpool, was opened on Thursday. The building, which has been erected from designs by Messrs. Duckworth & Metcalfe, architects, is constructed of white brick, with Stourton stone dressings, in the Palladian style. Seat room is provided for 850 persons. Attached to the church is a school-room, 60ft. by 27ft., and underneath are a lecture room 27ft. by 18ft., class-rooms, infant school, and vestries. The contractor for the whole of the work was Mr. J. H. Mullen, Walton-road, Kirkdale. The total cost of the new church and schools has been £5,633.

Pontefract.—On Wednesday the Marquis of Ripon, W.M., G.M.E., and P.G.M., of the West Yorkshire Masons, laid the foundation stone of the new church of S. Stephen, East Hardwick, near Pontefract. The new building will cost about £2,100 and accommodate some 230 worshippers. The style will be Old English, the building being cruciform in shape, with transepts. Mr. J. E. Davies, of Leeds, is the architect.

Portsmouth.—On Thursday week the Duke of Cambridge laid the first stone of a new church at Landport, the site of which has been given by the War Office. The church, of which Mr. Butterfield is the architect, will, when completed, consist of a nave and aisles, with north and south porches, and a chancel with transepts and vestry. The nave is to be 100ft. by 53ft. A lofty bell gable, pierced for three bells, flanked by two turrets, will surmount the chancel arch

Pudsey.—A new cemetery is about to be laid out at Pudsey. The chapels will be erected from designs by Mr. Payton, in the Early Decorated style. The total length of the buildings will be some 125ft. The mortuaries will be separated from the chapels by glazed windows, so that the mourners will be able to see the coffin without having it brought into their midst, and thus avoid any risk of infection. The two chapels, 22ft. wide by 36ft. long, will be exactly alike, with chancel and vestry in addition. The chapels will be lighted by rose windows at one gable, three-light traceried windows at the other, and by windows at the ends. The mortuaries will be lighted by five single-light windows. A handsome doorway leads into each chapel, with single-light windows at either side.

Reading.—The parish church of S. Mary, Reading, was reopened, after restoration, on Thursday week. The north aisle has been rebuilt, the eastern gable of the south aisle and two of the buttresses repaired, and the organ chamber completed. The south porch has also been restored. Mr. Joseph Morris, of Reading, was the architect, and Messrs. Wheeler Bros., also of that town, the contractors.

Ripon Minster.—The restoration of Ripon Minster, which has for the past ten years been in the hands of the builders, is now almost completed. The last portion of the work, that just completed, is the restoration of the nave, where an interior oak roof has taken the place of the former ugly flat ceiling. The new roof is constructed on the model of the roofs in the transepts of York Minster; it has the advantage of being, in the opinion of Sir Gilbert Scott (the architect of the restoration), of the very same plan which the original builders of the nave intended to adopt. The funds at the disposal of the Restoration Committee did not allow them to contemplate any alteration of the exterior roof of the nave, which is in very good repair, but unfortunately of a lower pitch than it ought to be; the consequence of this is that the new interior roof has had to be constructed from beginning to end without disturbing the exterior roof. The aisles of the nave have been admirably roofed with stone groining; the whitewash has everywhere been scraped from the walls; the whole building has been effectually warmed, and within the last few years very many of the windows have been enriched with stained glass. The whole work of restoration has cost £40,000, of which the Ecclesiastical Commissioners have contributed £15,000.

Rochester.—The parish church of S. Margaret, Rochester, having been restored, was reopened on Thursday week. Among the principal alterations are the removal of the gallery near the tower, the substitution of a new vestry for the former one, a new stained-glass window over the altar, and new coloured glass windows throughout the church. The whole of the pews have been removed. The works have been carried into effect by Mr. J. G. Naylar, at a cost of about £1,400.

Rugby.—The work of rebuilding the greater portion of Rugby School Chapel has so far advanced as to allow of its consecration, on Saturday last, by the Lord Bishop of Worcester. Some of the internal fittings still remain to be completed. The chapel has been mainly rebuilt upon the site of the former one, which it exceeds in length eastward by 40ft. while it is widened by the addition of double transepts and aisles on each side. The new part is altogether more lofty than the old—the west end—and a large central tower, about 20ft. square, has been erected, with an organ chamber beneath it. The east end is covered externally with a stone roof, and the old east window is retained, and occupies the central position in the wall. Four new windows, two on either side, have been added to the chancel, and filled with stained glass. The lower portion of the east wall is filled with various decorations, including some subjects in Venetian mosaic, while in the central panel there is a large cross. Dr. Arnold's grave remains undisturbed in the chancel, and is covered with a marble slab. The entire building is in the style of the thirteenth century, adapted to suit the materials employed in its erection—local white, red, and gray bricks, with a large amount of white stone relieved by red Mansfield stone in a few instances. All the old stained glass has been incorporated in the new building, and also the whole of the memorials. The designs are those of Mr. W. Butterfield, architect, of London, and the work has been executed by Messrs. Parnell & Son, of Rugby, builders.

S. Stythian's, Cornwall.—The final restoration of S. Stythian's Church, near Redruth, is about to be commenced. The roof of the south aisle, being entirely decayed, will be replaced by one of similar design. The square pews will be replaced by open free benches. Most of the windows are now filled with horrible circular-headed sashes fitted into pointed stone arches; these will be removed and stone traceried windows, as originally existing, will be inserted in their stead. The tower is almost identical in design in all respects with several in this district known as "Henry VII. towers;" their height is about 65ft. from floor, they have massive elaborately-wrought pinnacles at the four corners and battlements. The architecture of the church is of the same date as the tower, except that of the north aisle, which is of Edward III's. time. The nave is remarkable from the fact that it is 2ft. wider at the western end than at the eastern, whereby the perspective, being false, gives greater apparent length to the nave than it really possesses. The north aisle has already been restored. The plans have been prepared by Mr. James Hicks, of Redruth.

Tatenhill.—The church of S. Michael, Tatenhill, was reopened last week, after restoration. The principal features in the restoration were the rebuilding of the eastern wall from an entirely new foundation, as far as possible with the original stones, and the reinstating of the ancient buttresses, the restoration of the priest's door, the moulding of which was discovered by the architect underground, the restoration of the sedilia and font, the removal of the modern vestry, new stone and timber porch to the principal south door, new vestry formed by a screen in the tower arch, the restoration of the original floor levels and new encaustic tile floors throughout (the pattern tile were to some extent copies of tiles discovered in their original positions), new roofs to the original pitch, new sittings, chancel stalls, pulpit, altar, &c., and general repairs of the defective portions of the walls. The work has been executed by Mr. William Thorley, builder, of Ellaston, Ashbourn, from the designs of Mr. Basil Champneys, of Great Marlborough-street, London.

Wiveliscombe.—On Wednesday week the parish church at Wiveliscombe was reopened by the Bishop of Bath and Wells. The altar has been raised 5ft. above the body of the church, and a new chancel added, under the direction of Messrs Giles & Gane, architects, Furnival's Inn, London, the builder being Mr. Davis, of Taunton. The whole of the new part is inlaid with encaustic tiles, the chancel being inclosed by an iron screen.

York Church Building and Endowment Aid Society.—Last week the annual meeting of this society was held at York. The report stated that only four grants in aid of new churches were made during the two preceding years, while during the last year seven grants had been made, a number nearly equalling that of the years of the society's greatest activity. Most of the churches thus aided will be of considerable size, and will be situated in the populous districts of Sheffield, Hull, and Middlesborough.

One grant had been made for a new church in York. The Central Committee made the following grants :—Worsbro' Common, new church, £131 5s. ; Owlerton, Sheffield, new church, reapplication on altered plans, £270 18s,, in lieu of a previous grant of £300 ; S. Thomas, Hull, new church, £250 8s. 6d. ; S. Andrew, Drypool, Hull, new church, £393 15s. ; Streethouse, Normanton, new church, £52 10s. ; East Ardwick, new church, £162 2s. 6d., reapplication on altered plans, in lieu of a previous grant of £190; S. Andrew, Middleton-on-the-Wolds, increase of accommodation, £102 10s. ; Thornton-le-Street, £150, new parsonage, reapplication on new plans, and in confirmation of a previous grant of £150 ; Skelbrooke, Doncaster, new parsonage, £150 ; and Barnby-on-Don, increase of endowment, £300.

York.—The restoration of the north transept of York Minster is proceeding satisfactorily, the new stonework of the clerestory on the east side having already made considerable progress. The roof was some time ago stripped of its slating, and substantial boarding has been affixed to the old rafters, which were found to be in a very sound and excellent condition. Last week plumbers commenced covering in the roof with lead, and efforts will be made to have this important work finished before the coming winter. Mr. G. E. Street was in York inspecting the various works last week.

BUILDINGS.

Alloa.—The foundation-stone of the new municipal buildings, Alloa, was laid on Thursday week. Messrs. Frame & Sons, of Alloa, are the architects. The new buildings will have a frontage of 50ft., and will extend backward for about 80ft. The style is Classic. Above the windows a bold cornice will extend along the whole of the building. At the back of the Court-room there will be rooms for witnesses, retiring-rooms, &c.

Bedford.—The foundation stone of a new Corn Exchange was laid at Bedford on Monday. The new building will be in the Italian style, its internal dimensions being about 100ft. long, and 60ft. broad. It consists mainly of one long room forming the Corn Exchange, the various offices of the Corporation being located in the basement. It will be lighted by three segmental domes in the roof. Messrs. Ladds & Powell, of Bedford-row, are the architects, and were appointed by competition. The builder is Mr. Moore, of Bedford, and the cost will be about £7,000.

Bradford.—The Midland Railway Company are about completing a new Custom-house, adjacent to the Bradford station. The building, which is two stories in height, in the Classic style, has been erected by Mr. A. Neill, builder, Bradford, from the designs of Mr. Lee, architect to the company, Derby. The approach is through an advanced porch, ornamented with pilasters bearing carved capitals, the latter in the old French style, and leading to a geometrical staircase, which communicates with the rooms on the first floor. The long room, lighted by windows on either side, is 45ft. long by 15ft. wide, with a height of 15ft. The staircase steps are formed of teakwood, the balusters of ornamental ironwork, and the newel and handrail of walnut. The floors, window-casings, doors, and skirting-boards are of pitch pine, which will be stained and varnished. The vestibule will be laid with Minton's encaustic tiles. The cost will be between £3,000 and £4,000. The new bonding warehouse, 278ft. long, and 54ft. wide, is also nearly finished, at a cost of £28,000. The building is fire-proof throughout, the floors being of iron and concrete. It has been erected by Mr. A. Neill. Mr. W. Austin is clerk of the works. Various other works are projected on the Midland line. A new waiting-room of neat design is being built at Saltaire. New stations are to be built at Shipley, Keighley, Skipton, Long Preston, and Settle.

SCHOOLS.

Liverpool.—S. Peter's Schools, in Gilbert-street, have been completed, and are in full working order. They are of a simple, solid structure, and complete and efficient in their internal arrangements. They consist of two large rooms, 70ft. by 30ft., with adjoining class-rooms and offices. The rooms are lofty, well lighted and ventilated, and furnished with the most modern appliances for educational purposes. Accommodation is provided for 650 children. There are class-rooms, and retiring rooms for mistresses and pupil teachers. The buildings have been carried out from designs supplied by Mr. Edmund Kirby, architect, Liverpool. The builders were Messrs. Nicholson & Ayre, Liverpool.

Liverpool.—At a meeting of the General Purposes Committee of the Liverpool School Board, held on Monday last, the following resolutions of the Sites and Building Committee were confirmed, viz. :—"That 'Practical' be appointed architect for the school to be erected in Chatsworth-street, subject to his plans, modified according to the suggestion of the committee, being ultimately approved of by the Board and the Education Department." "That 'Spes' be appointed architect for the school to be erected on the Queen's-road site, subject to his plans, modified according to the suggestion of the committee, being ultimately approved of by the Board and the Education Department." "That 'A.D. 1872,' 'Con Amore,' and 'Gamaliel,' be requested to enter into a limited and new competition for the schools to be erected on the Roscommon-street site." For the Chatsworth-street site there were seventeen, for the Queen's-road site eleven, and for the Roscommon-street site ten sets of plans. The architects who have been successful for the Chatsworth-street site are Messrs. Reade & Goodison, No. 4, South John-street ; and for the Queen's-road site Mr. Thomas Cook, of No. 23, South Castle-street, and Mr. John E. Reeve, of Lord-street Chambers, 87, Lord-street, Liverpool.

S. Stythians.—The S. Stythians' School Board, near Redruth, Cornwall, are about to erect boys', girls', and infants' schools, from plans prepared by Mr. James Hicks. The plans have been approved by the Education Department, and the tender of Messrs. Williams & Chegwidden, of Helston, in the sum of £792, has been accepted. This includes for boundary walls, privies, &c. The cost of furniture and other expenses will probably bring the amount to £900, or about £3 per child, accommodation being provided for 300 children, calculated from the benches, and not from the superficial area, which, however, is 10ft. per child. The schools are 20ft. in width, 14ft. in height to wall plate, and the roof of open timberwork, varnished and plastered between rafters. The walls are to be nicely pointed and washed in colour. These particulars are given to show the difference of cost of the schools in this and other parts of the kingdom.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requesst that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the Building News School Planning Competition is extended to the 30th of November, 1872. For particulars, see Building News, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

Received.—R. C. D.—W. A.—H. G.—E. D.—D. F. & Co.—B. & P.—R. N. S.—G. & G.—H. V. & Co.—J. H.—Art.—J. & B.—E. M.—J. P. S.

R. Bland Dixion.—Plan of hospital to hand.

Smith & Brodrick.—Photo. of church and vicarage to hand.

J. T.—Thanks for offer to insert illustration of building, but as the drawing is bad, and the architecture no better, the drawing is returned unused.

J. T. Snape.—Drawing received and returned.

Jackson & Heazell.—Observations to accompany design to hand, but not the design itself.

Edward J. Tarver.—Too late. If not inserted elsewhere, it shall appear in our next.

J. W.—Your reply is an advertisement.

J. Wood.—Shall give one of Norman Shaw's soon.

R. A. Frazer.—The views of Cobham College will appear soon.

J. Snellgrove.—Yes, if the sketch is suitable.

T Hoddy.—We believe the author of the papers on "House Decoration" intends publishing them in a separate form.

A. H. Parker.—We gave the description as it reached us.

M. Barber.—Inquire of any life assurance agent.

Correspondence.

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GREEK AND GOTHIC.

To the Editor of the Building News.

Sir,—Mr. Gildard is aggrieved that I have not followed him in the irrelevancy of his rambles to trip up his heels and convince him that I am still, with Gothic architecture, on my legs. If I have not copied his example, and been brief in the statement of my case, it is because anything I could add has been already said, and ought to be familiar to any one professing independent judgment on the æsthetics of architecture and its history. Mr. Gildard was evidently started on a wild-goose chase after the "greatest achievement of human genius," in which pursuit it is well known that he could cry Eureka only by a metaphysical metamorphosis of the goose into the swan. I hoped to act as a condenser of his surplus steam. The greater part of his correspondence is a grand irrelevancy. His "greatest achievement of human genius" argument for Greek in our churches reminds me of Mr. Spurgeon, when he said the New Testament was written in Greek, and not in Gothic. The argument is good for Gothic as for Greek, and for Egyptian as well, if only there be achievement of genius in the construction and ornament of a church. Mr. Gildard has toiled to prove what all admit, the inimitable beauty and finish of the Parthenon ; and convicted me of errors and inconsistencies where his own misapprehension is at fault. I shall show that he can discourse a little nimble nonsense, too ; though I fear your readers will be justified in saying of us both as the husband says (in Scottish Doric) of his spouse—

> If my wife and thy wife
> Were in a boat thegither,
> Sixty mile frae ony shore,
> Wi' nane to steer the rudder :
> And if the boat was bottomless,
> And naebody to row,
> We weer would wish them back again
> To spin the pickle tow—the weary pund o' tow.

Let me assure Mr. Gildard that I have written in faith of the truth of every statement I have made. I believe, with Mr. Honeyman, that the path of Scotch church architecture has been one of progress, and full of promise for greater things than if we hoped to resuscitate a style in which any deviation from the models of perfection would be retrogression. The Greek seems rigidly inimitable in its beauty, and admits no further development ; and therefore, I say, that while there is endless hope for Gothic, there is none for Greek.

Mr. Gildard is, unhappily, so surfeited with "kail" compounded of the sentiments of Smirke & Co. (described by Bartholomew as most extravagant panegyric), that he has no stomach for any other food, and yet complains that I have not supplied it. But he forgets that I recommended Bartholomew and Ruskin as an alterative diet ; and till he has digested them I have still hope of his recovery.

Meanwhile, I shall try to clear away the dust which he has raised, and explain what I mean when I maintain that Gothic architecture is a greater achievement of genius than Greek. I believe that the feats performed by the intellectual athletes of Athens have never been excelled. But though Greek architecture in its own age and sphere has a glory which has not been surpassed, it does not follow that the genius of all after ages must bow down before it : that its glory is the glory of the sun, whilst Gothic, as a thing of night, has only the paler lustre of the moon. If Gothic had borrowed from the Greek, it might be so. But this is not the case. It is the sun of another, and I think a greater system. It is not an Æneid, but an Iliad ; a new creation of human genius and a greater, because it is a fuller development of all the essential parts of architecture, and nobler, too, because the hearts and eyes of men had opened on a world of beauty the Greek has never seen, and at which his highest aspirations had but dimly guessed. The genius which at that early age developed the Parthenon may be greater than that which produced the perfect Gothic, and yet the works accomplished may stand no comparison. Just as the glory of the sun at noon is far more brilliant than at the rosy dawn, so Gothic architecture is, and might naturally be expected to be, a vast advance upon the Greek. "As a man grows vider he grows viser," said the immortal Weller's papa, and so does the world. Necessity, the mother of invention, taught the architects of Rome that they must not go on for ever copying slavishly, as the Greek had done, the construction of timber huts. They invented the arch, and that again the Gothic nations developed into the Pointed form. But of the three—the architect who improved upon pillar and lintel till he got the perfect Doric of the Parthenon—or the architect who invented the arch or developed it into the vaulted dome, and built the Parthenon—or that other who first conceived the wonderful dynamics of vault and buttress in churches, such as S. Ouen at Rouen, which was the greatest genuis? I think they may well divide the honour, but with reference to the results accomplished, apart from the genius of the discovery—whilst the Greek could not in his day do more than he had done, he would have undoubtedly accomplished at a later period the greater things left for the Roman and the Goth to do. Mr. Gildard is confounding the greatness of the genius with the greatness of his work. He says that the introduction of the Classic arch is irrelevant in discussing the comparative excellence of Greek and Gothic. But the architecture of the arch was a new creation, destined to revolutionise the architecture of the world. The genius of Greek lay in its improving upon the Egyptian, and the genius of the Gothic consists in its improvements in the Classic arch. This architecture it was which has consigned the Greek in its perfection to the shades of the mighty dead. We may build in the style to revive a glorious memory, and it is right to do so, if we can when occasion offers. But the costliness of its beauty, the dearth of skill in its construction, and the narrow limits of departure allowed by it from the models we admire, have caused it, except as a rarity, to pass away. But Mr. Gildard would have evidence of this in the deliberate judgment of "men who have passed their lives in the profession, and who have obtained a position which nothing but a profound knowledge of and attachment to art could have given them." Before making quotation, I shall ask him to see one of many proofs of it in the history of Greek architecture, as contrasted with the Gothic, a page of history in the review of which his telescope has not assisted him. "Greek architecture," he says, "has courted and withstood the criticism of 2,000 years," and he is jubilant upon the fall of Gothic as the shades of Mediæval night dispersed. But what are the facts? The Greek had its day, but the Roman found it not equal to his requirements, and ruined his own grand conception by suffering it like a parasite to creep over his swarthy limbs—a fate, however, from which the Goth brought timely rescue. For more than 1,000 years Greek architecture was never heard of till revived by archæology, when it had a brief and butterfly existence, only to be caricatured in so many ways that we find Bartholomew complaining of the strange disrepute into which it had fallen. But Gothic architecture suffered an eclipse for only 300 years, and has been now restored to that honourable rivalry with her sister Classic in which she bids fair to hold her own.

As to the structural superiority of Gothic, Bartholomew says over and over again, "The dynamics of Gothic architecture outstrip in their combination of economy and skill and beauty all other efforts of the architectural practitioner, ancient and modern." As to the beauty of Gothic and its sculpture in particular, Mr. Ruskin says, "In Greek the human sculpture is perfect, but all other ornament subordinate. Greek and Egyptian ornament is mere superficial work, languid and lifeless, but Gothic stands out in prickly independence, frosty fortitude, &c. We can no more expect to derive pleasure and profit from an architecture whose ornaments are all of one pattern and whose pillars are all alike than we should from a universe where the clouds are all of one shape. Gothic invented a variety of form capable of perpetual development."

The above is answer to Mr. Gildard's request for proof of the excellence of Gothic sculpture in its own chosen sphere, as also explanatory of my speaking of the Greco-Egyptian style in the works of Mr. Thomson, which I have seen. The ornament is not sculptural but superficial; there is less of the pillar and more of the mantery of wall, and generally its beauty is the beauty of mass and abstract lines, and, as I said before, it is no ordinary genius that can produce such work as Mr. Thomson.

Mr. Gildard finds fault with my condemnation of solemn porticos and requiring solemn grandeur at the same time; but he can surely see that what is least desirable in a country house may be very desirable in a public edifice. If he wishes to understand the poetry of science there is a book by Hunt upon the subject, or by studying science he may make the poetry himself. I cannot, however, undertake to set him right as to poetry in general, nor have I philosophic force enough to see how one kind of poetry may be an impression and another an expression. I still maintain that the optical corrections in the Parthenon were calculated by the eye just as the architectural dynamics of the Gothic were created by a "sort of inspiration," without theoretic lore. But the poetry is all the same whether it be so or not. By "unnatural stiffness," I mean that absence of love for nature in her myriads of lovely forms which Mr. Ruskin condemns in the Egyptian art. By "the rigid Doric of the Parthenon," I mean its inimitable perfection in virtue of which you cannot deviate from the design but to the ruin of its beauty, and the very narrow limits within which variety is possible in Greek. Alterations and additions are inadmissible, and when a larger transit instrument is required for an observatory, the Dome of Playfair's gem upon the Calton-hill must not be raised more than 14in. The inference in favour of the future of Gothic, for observatories as well as churches, is plain, but I may not stop to defend my gift of prophecy.

I shall close by alluding to Mr. Gildard's paragraph where his philosophic force takes flight into the realm of metaphysics, and he talks of nature and humanity. "Legitimate architecture is art—not imitative, like painting and sculpture, but creative—and with Nature has nothing to do." If this be so then the Parthenon is not legitimate architecture, because its glory is in its sculpture, and that is imitative, not creative art, and with nature's noblest work has very much to do. Greek architecture is not legitimate, inasmuch as it is the imitation of timber construction. As to the Ionic volute, if it were not a prophecy of spectacles, it is the imitation of the convolutions of a shell. The above, however, is sense compared with the next sentence, "God created Nature, and in man, made in His own image, He created the faculty of creating art, and hence it follows" (by the night the day) "our association with architecture is not that of nature but of humanity." Ordinary logic tells us that whatever an "association of humanity" may be, it cannot be that without being at the same time an association of nature. The premise is plain, but the inference, if it mean anything at all, has as much connection with it as Tenterden steeple had with Goodwin Sands. Our associations with architecture seem all to be very natural (though often disagreeable and disappointing), but I give it up, and shall not further vex the philosophic wit because I cannot fathom it. The only explanation is that Mr. Gildard's "Nature" is something we are not accustomed to; but if Greek church architecture is to stand on such a bottomless abyss as Mr. Gildard's metaphysics, it may well say—

> Non tali auxilio nec istis defensenbus Ajax.

I feel assured that Greek, shorn of the glories of its pillars and its sculpture, is hardly worthy of the name. If this be the style Mr. Gildard desires to see in all our churches, where is the genius he proposes to lay upon the altar? 'Tis Greece, but living Greece no more. The beauty of abstract lines has interest only for the few; but the beauty of nature is felt and understood by all. The one will never become popular as an object of delight, of wonder, or of awe, because it lacks the poetry of nature. But in Gothic architecture we are taught to feel that the world we see is but a type of the world unseen—where it takes us to consider the lilies of the field, wreaths the flowers upon her capitals, and points in this, as in other ways, to where everlasting spring abides and never-withering flowers.—I am, &c., Another Protestant and Architect.

A SUGGESTION!

Sir,—If the present state and practice of "Gothic Art" in England may be considered a revival of Mediæval work (and evidence in proof is not wanting), we may safely conclude that it is our first duty and pleasure to study—sketch-book in hand—the grand old examples which still remain to us. And if we consider also how many valuable sketches are continually made by students, it is a matter of surprise when we think how many are laid aside in the folio. Therefore, I ask, Why should it be so? Why should we not form a society (national, if possible) for the publication of these sketches? There can be no doubt of success in this enterprise, if we may take as a criterion your own excellent precedent, "The Building News' Sketch-book." I should be glad if this suggestion were the means of opening up a discussion on the subject in the columns of your journal.—I am, &c.,

Manchester, October 22. Trefoil.

WHISTON SCHOOLS COMPETITION.

Sir,—I enclose you the last new thing in architectural competitions, extracted from the *Sheffield Telegraph*:—"Whiston National Schools.—Plans are required for new national schools at Whiston, to accommodate 180 children, to be built according to the requirements of the Privy Council, the total cost not to exceed £500, after allowing for the value of the materials of the old national school (to be pulled down), available for the new. State terms and estimate of cost for architect's plans (if accepted), and superintendence of the erection. No allowance for plans not accepted. No promise to accept the lowest estimate. All plans to be sent to Mr. Howard on or before November 1st, 1872. For further particulars apply to W. Howard, Rector, Whiston Rectory, Rotherham."—I am, &c., Ars.

S. ANDREW'S, HOLBORN.

Sir,—In your issue of Friday, describing the re-opening of S. Andrew's Church, Holborn, you speak of the new seats as being in imitation oak. Will you do me the favour to state that this is an error, the seats being, in fact, English oak, which has been slightly stained in order to make it correspond in colour with the old oakwork. All the new fittings throughout are of oak.—I am, &c.,

S. S. Teulon, Architect.

9, Craig's-court, Charing-cross, October 22.

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STAINED GLASS AND MURAL DECORATION.

Acton.—All Saint's Church, Acton, the consecration of which we noticed the week before last, has been enriched by the introduction of stained glass in three of the windows at the east end. The windows are the gift of the vicar, the Rev. A. Hunter Dunn, and his relatives, and have been designed and executed by Powell Brothers, of Leeds.

Leeds.—The lecture hall of the Leeds Church Institute, which was used as one of the places of meeting during the recent Church Congress, has been considerably enriched by the introduction of decoration and stained glass. The decoration is in accordance with the style of the building, which is Gothic of the fourteenth century, and consists of dado, arcade, and courses of ornamental bricks—with spaces left for the introduction of subjects from Church history, one of which, the landing of S. Augustine, has already been painted. The three large roses in the tracery of the east window contain busts of the Latin and Greek fathers, together with a figure of our Lord as High Priest, surrounded by the Evangelists and S. John Baptist. The smaller piercings contain angels. The lower lights are filled with painted quarries and coloured borders. The whole of the decoration and painted glass is by Powell Brothers, of Leeds, under the direction of the architects, Messrs. Adams & Kelly.

Wath-on-Dearne.—Two stained glass windows have just been erected in the south aisle of All Saints' Church, Wath-on-Dearne. They are of two lights each and of large size, and are designed in the richest style of the Tudor period. In one window, on a foliated ground, are shields and other heraldic devices, while in the other, likewise on a rich ground of foliated work, are medallions of angels holding texts. The window has been executed by Messrs. Lavers, Barraud, & Westlake, of London, from a design by Mr. Bentley, and the stonework of the windows has been carefully restored, under the direction of Messrs. Hadfield & Sons, architects, Sheffield.

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LAND AND BUILDING SOCIETIES.

Burton-on-Trent Building Company.—The report of the directors of this company has just been issued, and it appears from it that there will be a dividend to the shareholders of 2 per cent. This will take £520 18s., and will leave a balance from the year's receipts of £37 14s. 8d. for the expenses of the current year. The mortgage debt has been reduced by £1,650 during the year. The rents of the houses belonging to the company have been increased. From the balance sheet it appears that the capital of the company amounts to £26,117; the debts owing, to £3,471 6s. 9d., and the value of their property to £30,466 19s. 5d.

The Queen's Permanent Benefit Building Society, Hull.—The first annual general meeting of this society was held at its offices, No. 9, Scale-lane, Hull, on Monday week. The report of the directors, which was unanimously adopted, states that during the year 1506¾ monthly subscription shares had been taken, 340 of which, amounting to £17,000, had been advanced upon twenty-six different properties in Hull and the neighbourhood. The subscriptions, &c., received upon ordinary and advanced shares amounted to £3,923 16s. 3d.; and the amount received upon loan was £13,240 6s. 10d., making the total receipts for the year £17,164 3s. 1d. After paying all expenses, a balance or profit remains of £135 7s. 6d., or equal to 10 per cent. upon the capital employed, £50 13s. 8d. of which sum has been set apart by the directors towards the contingent or reserve fund.

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The stonemasons of Bradford have notified to their employers that on the 1st of May, 1873, they will require an advance of 3s. per week on the present rate of wages. The men state that in other trades artisans are receiving 35s. to 50s. a week, and they hope that when the time arrives the advance will be generously conceded without the necessity of a suspension of labour.

Intercommunication.

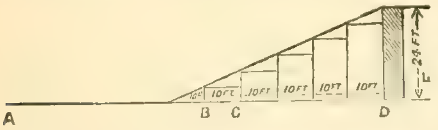
QUESTIONS.

[2675.]—**Books, &c., for Articled Pupils.**—Will some of the elder members of the profession kindly answer the following question, which is to us a very important one? We have two years of our articles unexpired (having served already 2½ years), and we wish to know what course of study, &c., we should pursue to become good practical architects. We can do general office drawings, &c., and understand perspective. If any gentlemen will kindly give us some advice as to what books to read, &c., they will earn the thanks of many more besides those of—THREE PUPILS.

REPLIES.

[2665.]—**Measuring Chimney Stacks.**—Would "R. C." kindly amplify his reply? In what district is the method he describes adopted? In high stacks, is not the price charged for the upper portions gradually increased with the height, say every 10ft. or 20ft.? What is a superficial yard of brickwork? It is to me something new, stated, I suppose, thus: 15 yards superficial stock brickwork in mortar 2½ bricks thick. Most brickwork is stated by the rod reduced, or by the cubic yard or foot, with a superficial measurement extra for the extra labour on facing only, or for extra cost of a superior facing brick.—M.

[2668.]—**Measuring the Height of Chimney Stacks, &c.**—The following is the most simple way: Measure the length of the shadow of the object whose height you wish to ascertain. Then place a staff (say one 10ft. long) perpendicular, measure the length of shadow which it casts, then as the shadow is to the staff so will the shadow of the object be to the object. As the sun must be shining to enable a person to perform this operation, I will give another method. Get two staves (say one 8ft. and the other 4ft. long), place them at a convenient distance from the object, so that by looking across their tops you can see the summit of the object. Then measure the distance between the staves, and also the distance from the base of the object to the first staff. Having got this data, proceed in the following manner: Supposing the distance between the staves to be 10ft., and the distance from the object to the first staff 40ft., for every 10ft. between the staff C and the object D allow 4ft. rise, to which add the length of the staff C. The truth of this will be more obvious by looking at the sketch. A E is the ground line, B and C are the two staves, and D is the object.—GEORGE DURRANT.



[2669.]—**Circle upon Circle.**—In answer to "J. E.," I have to state that I have had as much experience as any man on circle upon circle. I am making one at present. I have made as many as twenty at one time. I have tried all ways. I have made them from Nicholson's, but I found it a very roundabout way. I now get my heads out as I would a handrail from face moulds in two pieces, and what cuts out of the underside makes the sash head and beads already faced up, and ready to gauge up to the proper size. With respect to teaching handrailing and skew bridges in schools, I can tell you that there is a deal of twaddle taught, very little to the benefit of the master for whom they work. I greatly object to people teaching a trade they know very little about. There should be a practical man to each trade, and not an art master who can only give the plan and not the working department. Should I be permitted, I will give you a drawing showing my system of circle upon circle.—JOSEPH RILEY (author of "System of Handrailing"), Leeds.

[2671.]—**Party Walls.**—I have a somewhat similar case to that alluded to by your correspondents. My north external side wall of my house abuts on the garden of my neighbour. He has erected against my said wall a one-story brick building, but he gains no support from my wall, neither has he cut into or plastered it. If my wall were pulled down his building would in itself be self-supported, and would be an erection with brick walls on three sides and one side would be open. This occurs in the metropolitan district. I have asked him to contribute towards the cost of the portion of my wall which he so uses, but he positively refuses. The district surveyor says he cannot interfere, as it is a mere private matter between ourselves, and that so far as the public are concerned there is a good and sufficient wall between the two buildings in accordance with the Building Act, and that the question as to whether the wall is jointly owned or belongs wholly to one person does not concern him. Have I any remedy either to compel payment or to force my neighbour to build a separate wall?—P. B. W.

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Mr. George Scott, of Brighton, has been appointed to the curatorship of the New Public Free Library and Museum, Brighton, at a salary of £[illegible] per annum. There were about 20 applications for the appointment.

STATUES, MEMORIALS, &c.

CASTING OF THE STATUE OF THE LATE PRINCE CONSORT.—The bronze equestrian statue of the late Prince Consort, to be erected upon the Holborn Viaduct by the City Corporation, was successfully cast on Tuesday afternoon at the Eccleston Foundry, near Victoria Station. The mould was placed in a huge flask, within the walls of which it lay embedded in sand. The legs and the head of the horse and the rider had been cast previously, and were now fitted against the mould with the bare edges touching the main body, in order that the fusion might take place on their coming into contact with the hot metal. On the right of the door was the blast furnace, where the copper was being melted, and on the left were the two air furnaces, in which the alloy or white metal, consisting of zinc and tin, was undergoing a similar process in two crucibles. The hour fixed for the casting was four o'clock, and all being ready by that time, the plug was withdrawn from the blast furnace, and the liquid copper was decanted off into a crane ladle, an enormous cauldron capable of holding more than two tons, which had been previously well heated. When the bright red stream had ceased to flow, the crucibles glowing with a white heat were drawn up out of the wells of the air furnaces, the molten metal belching out brilliant green flames and dense columns of white smoke. These crucibles were then emptied into the large ladle. The fusion of the two metals produced a very fine effect with the dazzling jets of flame crowned by waves of smoke. The ladle was supplied with an ingenious mechanical arrangement by which it could be tilted in any direction by one man and its contents distributed slowly or fast at pleasure. It was now hooked to a "traveller" running on rails along beams, and, suspended in mid-air, was carried along until it was exactly over the tube in the flask leading into the mould, and slowly canted over, as the lava-like stream of fluid bronze rushed hissing and seething between the inside core and the outer skin of the model. The gas generated escaped by means of pipes, and was immediately ignited, the spare brass oozed out and ran away into a trough, and the cast was completed to the satisfaction of everybody concerned, the operation having lasted only half an hour. Mr. C. Bacon is the artist of the statue. Messrs. Young & Co., of the Eccleston Foundry, are now engaged in executing the Wellington bronzes for S. Paul's Cathedral, which, it is confidently expected, will all be completed in a short space of time.

EDINBURGH.—In the Dean Cemetery, Edinburgh, has recently been erected a monument to the memory of Mr. Thomas Ross, to whose liberality Edinburgh was indebted for the fountain recently erected in West Princes'-street Gardens. It is the work of Mr. John Rhind. Measuring 15ft. in height, it rises from an elaborately moulded base, the lower part of the shaft being covered with Celtic ornament, and the upper part presenting, in low relief, the stump of an old tree entwined with ivy. Another monument by Mr. Rhind, in a very different style, is placed against the west wall. This structure, designed after the Early English form of Gothic, consists of three cusped arches in freestone, supported on shafts of Inverness granite, and enclosing as many marble tablets. Over the arches, which project some little distance from the wall, and are groined underneath, rise three gablets terminating in ornamental crosses. In the centre gablet the arms of the family are elaborately carved, and the structure is further diversified with gurgoyles at the corners, floral bosses terminating the label mouldings of the arches, and capitals to the supporting shafts wrought in accordance with the general style. On the same wall is a handsome monument in freestone and marble, indicating the resting place of Mr. John Ritchie, one of the founders of the *Scotsman*, designed by Mr. William Brodie, R.S.A., and executed by M'Ewen. This work is a fine specimen of the application of Gothic architecture to monumental purposes. From a plain base there rises on each side a square column supported by buttresses, and terminating above the wallhead in crocketted pinnacles, with finials in which the outline of the Scottish thistle is readily recognisable. A marble medallion on a gilt ground occupies the space between the heads of the arches, and the remainder of the wall surface is filled in with ivy leaves and berries carved in low relief. Another monument worthy of special notice is the Runic cross, erected in memory of the late Mr. James Valentine Hagart, of Glendelvine. Measuring fully 12ft. in height, this structure presents on the lower part of its surface a panel inscription in raised letters, with ornamental tracery, consisting of twisted reeds and wreaths of passion flowers. At the arms of the cross the ornamentation takes the form of thistle leaves, and round the edges run a bold bead and fillet. The work has been executed by Mr. M'Ewen.

KENSINGTON.—The memorial statue of Lord Holland, a joint work of Mr. G. F. Watts and M. Boehm, has been placed on the south side of Holland Park, Kensington, along with a characteristic railing and some bronze castings, comprising panels in relief of [illegible] executed in a manner which the *Athenæum* calls [illegible] of a fitter [illegible] strangely out of place and inartistic.

Our Office Table.

COMMENCEMENT OF THE ARCHITECTURAL SOCIETIES' MEETINGS FOR SESSION 1872-73.—With the approach of winter the various architectural societies of London and the provinces are commencing to hold their sessional evening meetings. Several of the provincial societies have already held their inaugural meetings for the season, and the Architectural Association of London commences another and, we have no doubt, more successful session than ever, this (Friday) evening by a *conversazione*. A short address will be delivered by the President, Mr. J. Douglass Mathews, A.R.I.B.A., and prizes of books will be distributed to those of the members who distinguished themselves by their studies in connection with the various classes of the Association last session. On Friday next, November 1, the opening business meeting of the session will be held, when an inaugural address will be delivered by the President. On the following Monday, the 4th prox., the opening meeting of the Royal Institute of British Architects will take place, when Mr. T. H. Wyatt, the President, will deliver an address. Thus both the senior and junior members of the profession in London will be provided for.

A PROMISED CONTRIBUTION TOWARDS THE FORMATION OF A NEW STYLE.—The "battle of the styles," which is still (says the *Graphic*) left undetermined in this old country of England, is apparently being brought to a conclusion in the new country. Chicago is preparing an astonishment for the architectural world which, from an æsthetic point of view, is as novel as any of its achievements in the rapid manufacture of food. All its new hotels are to be amazing in size and splendour, but for "style" the establishment now being raised by Mr. Potter Palmer must be considered unique. That enterprising personage has been traversing Europe with a view to collect architectural suggestions, and the various fronts of his new hotel are to exhibit the results of his observations and reflections, and will display the spirit of the old eclecticism, which has hitherto been confined to metaphysical systems, in all its exuberant comprehensiveness. The building has three vast frontages. One of these, 254ft. in length, is to unite the characteristics of the Doge's Palace in Genoa, of the Church of S. Mark in Venice, and of an interior section of the Louvre in Paris. Our insular imagination fails in attempting to form a conception of the effect thus produced, but such, we are assured, is to be the fact. Another front, of about equal length, is less complicated in its decorations, which it borrows from ecclesiastical and palatial originals. It is modelled on a portion of the Vaudeville Theatre at Paris. France also supplies the style of a third and smaller front, and it is thus made to suggest "fashions" in building as absolutely as in dress. The hotel is to be some seven stories in height, so that ample space is given for the utmost flights of the architects' fancies; and, if he pleased, he might have placed all the old styles of Europe one on the top of the other, as the architect of the Bodleian tower at Oxford disposed of the five Classical styles of Greece and Rome. Within this enormous structure will be found as many as 830 rooms, professing to provide accommodation for no fewer than 1,000 guests.

IPSWICH DOCKS.—Mr. Bateman, C.E., has presented to the Ipswich Dock Commission a plan for altering the entrance to Ipswich Dock and improving the navigation of the Orwell. Mr. Bateman proposes to cut a new entrance at the south end of the dock, so that vessels can enter straight from the river, and to form a lock, 250ft. in length by 50ft. in width, at an estimated cost of £[illegible],000. Mr. Bateman further proposes an outlay of £70,000 in river improvements, so as to admit vessels drawing 18ft. of water.

NEW COLLEGES IN CAMBRIDGE.—The college for the education of women, which is being erected upon the Huntingdon-road, and about two miles from the town, is progressing satisfactorily. The building will be ample for the purposes to which it is intended to be applied. The Leys Estate, situated on the Trumpington-road, has been purchased by the Methodist Society for the higher education of sons of Wesleyans. A third scheme is also on foot for the establishment at Cambridge of a county college. It is proposed that the County College shall be an association of shareholders, registered under the Joint Stock Companies' Act, with a capital of £24,000 in £10 shares, and that a college be built in Cambridge for 300 students.

DESTRUCTION OF STONEHENGE.—The voice of the *Art Journal* must be heard in defence of the most valuable, or, at all events, the most irreplaceable, of our national monuments. The British vulgarian has attacked Stonehenge. Since the time of King David, and probably long before, "scrabbling on the wall" has been regarded as a mark of imbecility. But the barbarians who desecrate Stonehenge are not content with scrabbling the customary references to the old worship of the Garden Gods; they have cut their ignoble names deep and plain in one of the magnificent trilithons. The work has been done by some one accustomed to the use of a chisel—a gravestone cutter, or the like. Mischief of this kind is contagious; it tends to reproduce itself, like a pestilence. We may expect to see knife and file and chisel unloosed against this unique prehistoric monument; and a work on which eight centuries of our history has wrought no recorded change may be reduced, in as many years, to an unsightly ruin. We cannot but think that the law might reach the offenders; if not, its arm should be strengthened in this respect.

The Reading Carpenters and their Employers.—A suitable celebration of the satisfactory solution of the wages question by the Reading carpenters and their employers was held last week in that town. About 80 masters and men dined together. The chair was taken by Mr. Williams, and the vice-chair by Mr. Harris, builder, of Stanshawe-road. The Chairman, in the course of the evening, proposed "The Building Trade of Reading," to which Mr. Harris responded. Mr. R. Webber gave the toast of "Health and happiness to their employers," which was also responded to by Mr. Harris. Mr. Redford, foreman to Messrs. Wheeler, responded on behalf of his employers.

The Metropolitan Bridges.—The Works and General Purposes Committee has presented a report to the Metropolitan Board on the subject of bridge tolls, with a view of abolishing those impediments to free communication. Since the removal of the toll at Southwark-bridge the traffic over it has increased at least tenfold. The estimated cost of freeing the bridges on which tolls are still payable would be a million sterling; and it is proposed to raise this amount by extending the coal and wine dues. The coal dues bring in to the Corporation about £100,000 a year, to the Board about £200,000; but they will cease in 1889, and meanwhile they are devoted to other purposes. The Board must, therefore, have the co-operation of the Corporation of the City of London and of the Government.

Chalk in Coal Fires.—On p. 261 we gave the experience of a correspondent who, when a "poor parson," used to burn chalk and coal mixed, from motives of economy. The Rev. Henry Moule—well known in connection with the earth closet which bears his name—suggests another method of utilising chalk. His system is to cover the bottom of the grate two or three inches deep with small lumps of chalk, and on the top of that layer to place an ordinary coal fire. He says: "There may occasionally be some little slowness in the first kindling, but once kindled, the fire will generally, without additional fuel, and without any need of stirring, burn steadily for three or four hours. Any stirring should be of the coals alone." In a moderate-sized parlour grate one supply of chalk has served for a fortnight; for till the chalk is converted into quick-lime, its value as "supplementary fuel" will continue. When the transformation into quick-lime is effected, its utility indoors for whitewashing, plastering, &c., and for outdoor purposes in the way of application to the land, is self-evident. Mr. Moule says that by this plan "the consumption of coal for domestic purposes, and for warming large buildings, wlll be diminished 50 per cent."

Pastoral Staff for the Bishop of Hereford.—On Tuesday afternoon the new pastoral staff, which has been subscribed for by the clergy and laity resident in the diocese, was presented to the Bishop of Hereford at a meeting held in the Shire Hall. The staff has been carved out of a piece of oak which formed one of the pillars of the episcopal residence, which is said to have formed part of a tree growing long before the Norman Conquest. The staff is embellished with silver and gold enamel work, and precious stones. Mr. Lodman, architect, was the designer, and the work has been carried out jointly by Messrs. Cox & Son, Southampton-street, Strand, and Mr. J. Keith.

Tunstall.—The Local Board of Tunstall, Staffordshire, recently instructed Mr. John Elliot, C.E., of Newcastle, to inquire into all the recognised systems of dealing with sewage, and to report to them on the subject. After a careful examination of the principal irrigation farms and of the different precipitation processes, Mr. Elliot has advised the Board to adopt General Scott's process of precipitation and conversion of the product into cement. The cement made by the process, Mr. Elliot said, was very good. The Board thought the system feasible, and General Scott's terms for the use of his patent reasonable. The system is now in operation in Birmingham, West Ham, and Ealing.

LEGAL INTELLIGENCE.

Knightley v. Wilkinson.—(Before Mr. Bridge, at the Hammersmith Police-court, on Thursday, October 17.)—The defendant, Mr. Wilkinson, is the owner of a building estate at Hammersmith, upon which a large number of houses have been erected. Towards the end of last year he let a plot of land to Mr. Foulkes, who gave a proper notice, and erected a carcass, but abandoned it at the end of December, when plate high. In this roofless condition it remained till July of the present year, when the District Surveyor found men again working; the brickwork had been undertaken by one man, and the carpenter's work by another. Upon each of these a "change of builder" notice was served, but each returned it, saying he was not the builder, but working for Mr. Wilkinson, to whom a change of builder notice was also sent, but he paid no attention; hence the proceedings. For the defence, the interpretation of the word "builder" was depended upon, but as the work of finishing was let out to several persons, the magistrate held that Mr. Wilkinson had control, after the manner in which builders usually control their undertakings, that Mr. Wilkinson had stepped into Mr. Foulkes's shoes, and he fined him 10s. and costs. Notice of appeal was given.

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CHIPS.

At Southampton a new music hall has been nearly completed. The building was designed by, and is being erected under the superintendence of, Mr. Bedborough, architect. Mr. Gambling is the builder.

A new Wesleyan chapel has just been completed at Stacksteads, Bury. The building, which will seat 800 persons, is of stone, in the Corinthian order, the architect being Mr. George Woodhouse, of Bolton.

The ancient parish church of S. Michael, Tatenhill, was reopened on Tuesday, after restoration. The church has been restored at a cost of about £800, and about £1,200 was expended in the restoration of the nave. Mr. Basil Champneys, of London, is the architect.

A public hall is to be built at Clitheroe, under the Companies Act, at a cost of £3,000.

A new Mission House has been opened this week at Arbroath, N.B. It is in the Gothic style, and consists of a hall and vestry, with an apse at the east end. It will seat 275 persons. Mr. Aitkenhead is the architect.

The lease of Astley's Theatre has been purchased by Messrs. John & George Sanger, who have placed the alterations in the hands of Mr. J. T. Robinson, architect, of Steeles-road, Haverstock-hill. The cost will be about £5,000. It will be opened at Christmas as an amphitheatre. Mr. Robinson has lately executed Hengler's Cirque, Victoria and Pavilion Theatres, and re-decorated Drury Lane and Adelphi Theatres.

Two more London churches are to be destroyed and their revenues will be absorbed by other cures. The doomed edifices are those of S. Martin Outwich, and S. Peter Le Poer.

The *Graphic* of Saturday last contained an excellent portrait of Sir Geo. Gilbert Scott, R.A.

The restoration fund account of S. David's Cathedral shows that of the £25,000 required for the estimated work, £21,500 has been disbursed, leaving £3,500 to be raised. The repair of the north transept, at a cost of £2,000, has been undertaken by one of the Canons, who will next year undertake to repair the roof of the Chapter House.

Cadoxton Church, Neath, was reopened on the 17th inst., after being completely restored and remodelled. Some thirty years ago the church was for the most part rebuilt, and a new aisle added to it.

A new church is in course of erection at Prestonville, Sussex.

The organ at Falmer Church, which was built some years ago by Mr. Pileber, of London, has been repaired by Mr. Gates, of Upper North-street, Brighton.

A new organ, built by Walker, has just been opened in the Church of Monkton Wyld, Dorset. The compass is from CC to G, 56 notes, and the cost was £250.

It is proposed to build a new market house for Ulverston, from plans by Mr. Grundy, architect.

Plans are in preparation for the construction of buildings for the Scottish Military Depôt Centres at Greenlaw, Hamilton, and Aberdeen. At Greenlaw alone the cost will be £30,000.

A committee of the Chesterfield and Derby Institute of Engineers has been appointed to consider the possibility of erecting a memorial hall, to cost £20,000 to £30,000, in memory of George Stephenson.

Palmer's Hotel in Chicago will cost 1,500,000 dollars; the frontages will be 245ft., 253ft., and 125ft., and there will be 830 rooms. The Pacific Hotel will have 475 rooms, and the Sherman House 275.

Mr. Joshua Sallerfield, of Manchester, has given £10,000 towards [illegible] convalescent hospital for that city.

Amongst the buildings in progress in Melbourne at the present time is a new arcade, which is to be erected, at a cost of £16,000, on the site of the Haymarket Theatre, which was burnt down about a year ago.

A valuable Chinese idol having been presented to the Prince of Wales, he has employed Messrs. Rattee & Kett, wood carvers, of Cambridge, to construct a shrine for it. The idol is to stand near the entrance to Sandringham.

Dante's house in Florence continues to be utterly neglected; the windows are out, and the house has the appearance of being gutted. The only parts uninjured are the arch over the door, and the inscription.

A prospectus has been issued of the Southport Pavilion and Winter Gardens Company, with a capital of £40,000. The object of the promoters is to erect an aquarium, pavilion, conservatories, &c.

On Monday week the Mayor of Leicester unveiled two statues of Wickliffe and Latimer, placed in niches of the Congregational Church.

At a meeting of the Darlington Town Council, last week, the report of the Hospital Committee was adopted, and it was resolved to erect the building forthwith, at a cost of £9,000. The architect is Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, to whom the first premium was awarded in March last.

The Secretary of State for the Home Department has given his consent for the appropriation of Leyton Park House and grounds, consisting of twenty acres of gravel land, as the site of a new cemetery for north-east London; and a company has been formed to carry out the undertaking.

A memorial brass has recently been placed in Exeter College Chapel, Oxford, by Messrs. Hart, Son, Peard, & Co., of London, in memory of Arthur Looman Burleigh, late Commoner of the College.

At the last meeting of the Brighton Town Council, the salary of their surveyor (Mr. P. C. Lockwood, who has held the appointment for 14 years) was increased from £400 to £500 per annum. The resolution, which was proposed by the Mayor, was carried by acclamation.

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Trade News.

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TENDERS.

Brighton.—For works at 94, North-road, Brighton, new shop and alterations and additions. Mr. John Hill, architect:—

Newnham	£144 0 0
Barnes	118 0 0
Hall (accepted)	115 0 0

Brighton.—For new church at Prestonville, Sussex. Mr. John Hill, architect:—

Hall	£2100 0 0

Brighton.—For the erection of public elementary schools, Richmond-street and Sussex-street, Brighton, for the Brighton School Board. Messrs. Banister Fletcher & J. S. Nightingale, architects. Quantities by Mr. T. Simpson:—

	For the whole work.	Extra if red brick facings and black bands.	Deduction if basement play-sheds are omitted.
Hollands	£9953 0 0	£82 0 0	£300 0 0
Blackmore & Howard	9499 0 0	169 16 5	305 3 6
Newnham	9460 0 0	120 0 0	340 0 0
Allen & Baker	9443 0 0	172 0 0	333 0 0
Barnes	9395 0 0	220 0 0	330 0 0
Waterson & Co.	9100 0 0	150 0 0	345 0 0
Reynolds	9075 0 0	139 0 0	310 0 0
Lockyer	8882 0 0	240 0 0	300 0 0
Cheesman & Co.	8850 0 0	225 0 0	320 0 0
Spreadborough & Co.	8750 0 0	201 0 0	280 0 0
Sawyer	8590 0 0	300 0 0	300 0 0
Stenning	8400 0 0	368 0 0	656 0 0
Chappell	8381 0 0	157 0 0	296 0 0
Bridgman & Nuthall	6522 12 11	450 0 0	452 0 0

Chislehurst.—For the erection of five cottages at Chiselhurst, Kent, for Mr. O. Edwards, Hackney-road Mr. William Mundy, architect. Quantities supplied:—

Wood	£1546 0 0
Wimborne	1458 0 0
Marr	1348 0 0
Grover	1288 0 0
Lark	1174 0 0
Brown	1089 0 0
Tapsell	1052 10 0
Dyer	1050 0 0

Hastings.—For warming the Pavilion on the Hastings and S. Leonard's Promenade Pier with hot-water apparatus. Messrs. Cross & Wells, architects:—

True	£836 0 0
Bacon & Co.	820 0 0
Lake, Carlsen, Stokes, & Co.	730 0 0
Cheal	725 0 0
Smeaton & Co.	716 0 0
Huggett	690 0 0
[illegible]	676 0 0
[illegible] & Wilson	670 0 0
Fraser Bros.	615 0 0
May	598 0 0
Jones & Son	578 10 6
Allerton & Shrewsbury	570 0 0
Wattier & Smith	525 0 0
Cannon & Edmonds	500 0 0

Chipping Barnet.—For paving, Chipping Barnet, Herts. Mr. John Ladds, Chapel-street, Bedford-row, W.C., architect and surveyor. Quantities supplied by Mr. Thomas Ladds:—

	High-street. New York Stone. £ s. d.	Wood-street. Old York Stone. £ s. d.	Union-street. Brick. £ s. d.	New road. Brick. £ s. d.	Moxon-street. Brick. £ s. d.	Total. £ s. d.
Aspinall & Sons	2053 6 0	469 13 0	582 8 0	328 13 0	306 11 0	3740 19 0
Alderson	1998 10 0	636 0 0	368 0 0	280 0 0	198 10 0	3481 10 0
Burton	1810 0 0	394 0 0	440 0 0	258 10 0	182 10 0	3089 0 0
Lloyd	1815 7 7	393 14 4	369 16 6	245 7 10	184 15 0	3009 1 3
Ewens	1649 1 4	235 2 0	389 3 0	222 7 0	165 18 0	2661 5 4
Knight & Sons	1195 0 0	339 0 0	368 0 0	210 0 0	153 0 0	2265 0 0
Alternative Tenders for Paving the Streets with Patent Victoria Stone, 2in. Thick.						
	New Victoria Stone.	Old York Stone.	New Victoria Stone Paving.			
The Patent Victoria Stone Paving Company	1427 0 0	383 0 0	445 0 0	253 0 0	217 0 0	2725 0 0
Ewens	1508 0 0	225 2 0	487 3 0	273 4 0	211 5 0	2715 6 0
For Asphalting alone, Exclusive of Kerbs and Ground-work Connected with Same.						
The Val de Travers Asphalte Company	849 0 0	—	290 0 0	194 5 0	135 5 0	1460 0 0
The General Asphalte Company	1052 10 0	—	363 2 0	242 16 0	169 0 0	1827 18 0

Mr. Ewens' tender accepted, subject to approval of sureties, &c.

Hants.—For mansion for the Rev. Wm. Smith, Woolmer Forest, Hants. Mr. John Hill, architect. Quantities supplied by Messrs. Lansdowne & Pollard:—

For Walling.

Drakes' Concrete Company	£1292 0

Other Trades.

Kemp & Pocock	4649 15

Hastings.—For offices and stalls on the Hastings and S. Leonard's Promenade Pier. Messrs. Cross & Wells, architects. Quantities supplied:—

		Partly Roofed with Lead.
Howard	£3350	£3470
Veller	3270	—
Tupper & Carr	2980	3066
Brown	2971	3050
Avard	2971	—
Jukes, Coulson, Stokes, & Co.	2935	3013
Putnam & Fotheringham	2920	2976
Stenteford	2793	2886

Holborn.—For sundry alterations and additions at the Inns of Court Hotel, Holborn, for the Midland Investment Corporation. Messrs. Lockwood & Mawson, architects. Quantities by Mr. W. Brown:—

Wagstaff	£2695
Hill, Keddell, & Waldram	2613
Sewell	2546
Longmire & Burge	2455
Boyce	2410

Holborn.—For general repairs, cleansing and painting throughout at the Inns of Court Hotel, Holborn, for the Midland Investment Corporation. Messrs. Lockwood & Mawson, architects. Quantities by Mr. W. Brown:—

Boyce	£2404
Hill, Keddell, & Waldram	2388
Wagstaff	2300
Sewell	2257
Longmire & Burge	2143

Kent.—For erecting a villa at Cudham, Kent, for S. Packman, Esq.:—

Blake & Ramplen	527

Lancashire.—For the erection of three houses in Firs-lane, Leigh, Lancashire, for Mr. John Smith. Mr. H. J. Boardman, architect:—

Trafford (accepted)	£524

Mitcham.—For drainage work, cesspits, and pumping machinery at Industrial Schools, Mitcham. Mr. H. Saxon Snell, architect:—

Wall (accepted)	£823 0 0

Newport (Monmouth).—For the erection of school buildings at Newport, Monmouth, for the Newport School Board. Mr. Lawrence, architect:—

Prosser	£1516
Whitaker	1500
Bevan & Sons	1495
Richards	1492
Linton	1473
Hazell	1422
Jones & Allen	1400
Miles (accepted)	1400
Architect's estimate	1260

Nuneaton.—For new Wesleyan Chapel, Nuneaton. Mr. W. Burton, architect. Quantities supplied:—

Marriott	£1860 0 0
Linnells	1570 0 0
Towers	1408 15 2
Neal	1350 0 0
Sackree	1350 0 0
Hardy	1290 0 0
T. & G. Harrold	1247 15 0
Spencer	1183 13 8
Fox & Hood (accepted)	1160 0 0

Putney.—For the erection of a boat-house on the bank of the Thames, for Messrs. Robinson & Sims. Mr. G. Edwards, architect. Quantities not supplied:—

Hawkes	£567
Gibbs	545
Aries (accepted)	520

Putney.—For the erection of cow stables for Mr. F. J. Morrison. Mr. R. Niblett, surveyor. Quantities supplied:—

Adamson & Sons	£329
Aviss & Co.	318
Aries (accepted)	280

Shooter's Hill.—For painting and general repairs at the Shrubbery, Shooter's Hill, for W. Carter, Esq. Mr. G. Judge, jun., architect:—

Blake & Ramplen	£262

Stanstead.—For the erection of new school at Stanstead, Suffolk. Mr. Fowler, architect. Quantities not supplied:—

Scott	£346 0 0
Cadge	251 18 6
Pearson	237 0 0
Theobald	219 10 0
Smith (accepted)	201 18 0

West Cowes.—For the erection of two villa residences at West Cowes, Isle of Wight. Mr. Thomas Dashwood, Ryde, architect:—

Thomas	£2768
Ball	2695
Jolliffe	2570
Sibley	2489
Barton	2345
Meader (accepted)	2270

Worplesdon.—For the erection of new national schoolroom and teachers' house at Wood-street, Worplesdon, Surrey. Mr. Henry Peak, architect:—

Swayne & Sons	£564 0 0
Pearce & Clark	510 0 0
Garnett	508 0 0
Mason	499 0 0
Strudwick	495 10 0
T. & J. Lee (accepted)	453 0 0

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COMPETITIONS OPEN.

Chester, October 31.—For plans for the alteration and improvement of S. Paul's Church, Boughton. The architect whose plan is most approved will be employed as the architect of the works, on the usual conditions, and a premium of £20 will be given for the second best.—Rev. H. Falloon, S. Paul's Parsonage, Chester.

Chester Union, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

Leyburn Union, November 14.—For plans and specifications for a new workhouse, to be erected at a cost not exceeding £3,000. A premium of £50 will be given for the plans and specification chosen.—Mr. R. Chapman, Clerk to the Guardians, Leyburn, *viâ* Bedale.

The Royal Northern Agricultural Society (Dwellings for Agricultural Labourers), October 31.—Premiums are offered by this society for sets of plans, with specifications, for labourers' dwellings of the following description, viz:—Class I.—Separate cottages on one floor, or on two floors. Class II.—Blocks of two or more cottages on one floor, or on two floors.—Mr. Alexander Yates, Secretary, 83, Union-street, Aberdeen.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

Wraysbury (Bucks), November 4.—For plans for schools and teachers' residence.—Mr. Doulton, Vine House, Wraysbury, Bucks.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Batley, October 28.—For sewering, levelling, paving, flagging, curbing, and channelling Balk-street.—Mr. T. Dean, Town Clerk, Town Hall, Batley.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

Canterbury, December 2.—For a concession of the town sewage.—Mr. R. W. Flint, Town Clerk, Castle-street, Canterbury.

Crewe, November 1.—For the timber standing upon the land taken for widening the Crewe and Stafford line.—Mr. Whiteman, Prince Albert-street, Crewe.

Drighlington Local Board, October 31.—For the purchase of the surplus stock of mains, bends, socket-caps, plugs, and junction-pipes.—Mr. J. Smith, Solicitor, Birstal, near Leeds.

East Preston Union, November 5.—For the erection of a new workhouse.—Mr. G. B. Nichols, Architect, Handsworth, Birmingham.

Elland-cum-Greetland Gas Company, Nov. 1.—For the purchase of the tar and ammoniacal liquor for a period of one or three years.—Mr. R. West, Secretary, Gas Office, Elland.

Gaslight and Coke Company, October 31.—For the purchase of the coke manufactured at Beckton, from January 1 to September 30, 1873.—Mr. J. O. Phillips, Secretary, Horseferry-road, Westminster.

Great Western Railway, October 30.—For the purchase of old materials.—Mr. F. G. Saunders, Secretary, Paddington station.

Hornsey Local Board, November 2.—For the supply of granite, rag, flint, ballast, clay, and hard core; paving, curbing, and channelling; for paviors' work; and for collecting and removing the dust, &c.—Mr. W. Hammond, Clerk to the Board, Southwood-lane, Highgate, N.

Kingstown Harbour, November 7.—For the erection of stores, storekeeper's dwelling-house, timber jetty, and other buildings on the West Pier.—Mr. W. Lees, Secretary, Irish Lights Office, Dublin.

Leavesden Woodside (near Watford), October 31.—For taking down and rebuilding the chimney-shaft at the S. Pancras Schools.—Messrs. Richardson & Waghorn, Surveyors, 7, Craven-street, Charing-cross, W.C.

Metropolitan Board of Works, November 7.—For the construction of 2,257ft. of brick and pipe sewers and other works in Whitechapel.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens.

Morley Local Board, October 30.—For levelling, paving, and flagging Upper Fountain-street, New-street, and Cross-street.—Mr. J. Rayner, Clerk to the Board, Morley.

Northampton, November 2.—For the erection of a large house, shops, and premises, in connection with the Swan Hotel.—Messrs. E. & F. Law and Sons, architects, 29, Abingdon-street.

Okehampton (Devon), November 1.—For the erection of school buildings to accommodate 125 boys and 125 girls, and a residence for the master.—Mr. R. L. Fulford, Clerk to School Board, Okehampton, Devon.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 1, 1872.

THE WORKMAN'S SHARE IN ARCHITECTURE—I.

WHAT IT WAS.

OUR poor "Malade Imaginaire" of an age, whose chief ailment seems to be the belief that it has all the diseases on record, and whose worst symptoms come from a surfeit of doctors' stuff, never finds any lack of medical advisers. Their opinions are contradictory enough, but their way of proceeding is one and the same. They begin by a discourse on the alarming nature of the illness; they work on the patient's nervousness till his blood runs cold, and then out comes the inevitable pill-box. In architectural matters this sort of thing happens regularly once or twice a year; of late we have had a specimen of it almost every quarter. The trick has been played so often that it really must be losing its effect. Each new comer must by this time be hard put to it to outdo his predecessors—to make a longer face, or tell a more terrible tale. It is to be hoped, however, that the fraternity will not be discouraged. The faster they arrive, the surer they are to be found out, and the sooner will their unhappy dupe pack them all about their business, and go to his work with a will.

It is not by being frightened at the evils of the time, either in art or anything else, that we shall ever get rid of them; nor is it by letting ourselves be persuaded that they are worse than they are. Sensational writers, who are nothing if they cannot make their readers' hair stand on end, paint them of appalling magnitude. If they are only lucky enough to see a mouse, or even to hear of one at second-hand, they cry out instantly that there is a lion in the way; and people who run first and look afterwards are sometimes persuaded that there is. It may be worth while to examine pretty closely the last new source of terror, and see if it really makes the path on which architecture is now travelling quite so impassable as we have been told This, of course, is the separation between design and workmanship: the fact that our buildings are arranged and put into shape, not by the men who erect them, but by architects who, as a rule, do not handle a mallet or a chisel. This fact, we have just been solemnly assured, is enough to ruin our architecture beyond all hope. All the structures, of whatever age, which are worth looking at, were put up, it is stated, on precisely the opposite system—the system, that is, of every workman designing his own work; and till we adopt the same one, we are only going on more and more certainly to destruction. This is such a sad conclusion that one hesitates to be convinced of it by the loudest vociferation. Considering it calmly, there seem to be two things still unproved: first, that this *was* the actual system of all past ages; and, secondly, that even in that case it must always be the only possible one.

The latter of these is a theoretical question, and, like others of its class, may be left for time to answer. The former relates to a matter of fact, and can surely be settled one way or the other. If there ever was a period when all work was designed by the men who did it, that period, it will probably be admitted, was during the Middle Ages, and to them, therefore, the inquiry may be limited. All that is necessary is to take any first-class building, either in England, France, Germany, or anywhere else where the Gothic style prevailed, and ask if it is possible or conceivable that it grew up in the haphazard way in which we are told. Look at Lincoln Cathedral, or Salisbury; look at Chartres or Laon, look at Limburg, or the Church of Our Lady at Treves, and try to conceive such structures shaping themselves so by the individual caprices of the masons and wallers who built them. It is precisely the general design—the one all-mastering idea by which the details are bound together—which is the most striking thing about them. It is this that everybody sees, from the most ignorant to the most cultivated, and cannot help seeing, unless he looks at them like a fly, by a square inch at a time. It needs no more than ordinary eyesight to dispose of such a theory as that of the *Quarterly Review*, with all its consequences. The main thing in every great architectural work, whether ancient, Mediæval, or modern, is its *general design*, and the highest place in architecture is that of a general designer. When we come to painting, sculpture, and decoration, the case is different. Details of these classes lose their life and spirit unless they are executed by the very men who invent them, and in these our present practice is consequently far from what it ought to be. Architecture proper, on the contrary, which deals with arrangement, construction, composition, which binds all the parts together into a whole, and gives us a majestic figure instead of a heap of disjointed limbs, must obviously, and as a matter of necessity, have always gone on a different principle. The man who designed a cathedral certainly did not build it all with his own hands; probably, in a majority of cases, he built no part of it whatever. If he had talents for sculpture, he may have done some of the carving, or if he had talents for painting, he may have done some of the coloured decoration; but his architecture was none the better if he did, and none the worse if he did not. A judge of sculpture and painting he must have been, or he would not have been able to control the decorative workmen so as to make their work harmonise with his; but it does not follow that he always, or often, worked along with them. In a large building he would usually find enough to do without, for the general design of a large building is no trifle. It is enough, and must always have been enough, to demand the highest efforts of the ablest men that could be found. True, the Mediæval architect did not have to design every detail himself, as have his nineteenth century successors; but he had to do what needs no less care and diligence, to fix rigidly the limits within which others might design them. His first business, no doubt, was to settle his plan and decide how to vault and roof it; to fix on height of his piers, the curves of his arches and groin-ribs, and the levels of his strings, parapets, and ridges. It sounds simple enough; but, perhaps, no man now living knows the thought and labour, the years of study, and the moments of happy invention, which in a first-rate edifice it involved. Yet all this was but the skeleton of the work. When it came to the clothing it with the forms of beauty which we see, it is hard to tell how much to attribute to the master-mind, and how much to others. It may be imagined that the treatment of minor secondary divisions might be turned over to "subordinates;" we might fancy one settling, for instance, the general disposition of parts in a transept front, another dealing with the choir, and a third putting his whole imagination into some such lovely tower as those at Lincoln or Caen or Senlis. Even this is difficult, in many cases, to believe in; there is such an unmistakable unity about the composition that a divided authorship, even to this limited extent, seems impossible. It is to be remarked, too, that although it were proved that this sometimes, or even often, happened, it would be a very different thing from proving that each individual workman designed his own work. Suppose, for instance, that we owe the composition of the east end of Lincoln Cathedral, not to the master-mason who arranged the general scheme of the thirteenth century work there, but to some one else who filled in the outlines he had supplied; still, this some one else did not pile up the whole east end himself. It took many workmen, we may be sure, to do it, and in doing it they were not carrying out their own ideas at all, but those of another. So it must have been everywhere, and in all ages, wherever any great work was produced. Unity is the first condition of art, and it is only to be attained by subordination. In a perfect system, the greatest man would be entrusted with what requires the greatest powers—namely, general design, and would have the choice and control of the workmen who over-ruled, each according to his ability, some less and less important division of the common task.

So much, then, for what was *not* the workman's share in architecture. There was no art commune formerly, any more than now, in which everybody did as he listed. There was no dead level with the same lot for each, whatever his intelligence, his experience, or his preferences. As a rule, we may be sure, from the results, that there was not the one thing that is even worse than this—an upside-down subordination—with the fools at top, and the wise men at bottom. Such a system is and has been common enough in most spheres of labour, where wealth and influence and plausible pretence never cease from trying to keep down practical ability. In the architectural world, for several centuries during the Middle Ages, practical ability did somehow manage to get to the top and keep there, with the results we see. When it does so again, and as far as it may be doing so now, we shall see results of the same kind. The great desideratum for our architects is not their being workmen or not workmen, but their being fitted, both by talent and by training, for the position they hold; and for our architecture itself, the pressing want is that they should be able to get subordinates who are equally fit for secondary places. It does not seem possible that in the Middle Ages themselves any large part of the workmen can have had to do with design, even in details. Capacity for designing is not universal, nor can it be said in any high degree to be common, and yet many of the very smallest details in good Gothic work do display it in perfection. No doubt, then as now, a large proportion of workmen had purely mechanical abilities, which, by the way, are by no means to be under-rated. But those who had the power of invention found opportunities of using it, and constantly greater opportunities as their power matured. In minor details, no doubt, such men frequently designed their work as they went on, and this gives life and freshness to it if it is of a decorative character. There is no advantage in having purely mechanical work designed by the men who execute it, though there may often be a great advantage in having it designed by an architect on the spot, who can look at his half-completed building and see what it wants. Its form once wisely fixed on, however, it matters little who chisels it out. While it is only geometrical forms and plane surfaces that are in question, it is of very little consequence whether they were invented by the man who works them or by another. A waller will not put any more art-feeling into his wall, even if it is he instead of the head designer who settles how many feet high it is to be; and so of everything else that is merely done by rule and line. But when it comes to carving or inlaying, and much more to the higher branches of figure sculpture and painting, it is a different matter. It is here, for the most part, that modern architecture fails; not so much, in its best examples, in its general design as in the lifeless character of the decoration. We lack workmen who are competent to it; and the few artists who might be competent refuse to recognise the necessary limits to their freedom. We can see that the decorative workmen of old had liberty to design their own work, but it was liberty within rigid bounds, and the more important the work, the more closely the boundaries had to be observed. There were the limits of the general form and size of each particular detail. If it was a doorway, for instance, its outline and dimensions were fixed by the internal planning, the height of the stages, and the general scheme of the elevation. The proportions of the arch had to harmonise with those of other arches around it, and its section, down to the minutest moulding, might only be varied within the limits of the style. The style, we may say, was the key in which the whole building was pitched, and this once settled, every workman, whether he approved it or not, was obliged to conform to it. No doubt there were conservatives and radicals in those days, men who much preferred the style of fifty years before, and men who were looking forward to the development that was to come fifty years later. But their liberty of choice did not extend to these ; the master-mason, while he felt their work to be invaluable and indispensable, took care nevertheless that it should be in unison with his grand idea. The sum of the whole seems to be this: that there were head designers, as to whom it is not of the slightest importance whether they were called architects, or master-masons, or anything else ; that there were art-workmen who both designed and executed carving and other decorative details, and who had liberty of invention according to their powers, and with such restrictions as were needful to preserve unity of architectural feeling ; and, lastly, that there were very many other workmen, such as wallers and ordinary stonemasons, who sometimes invented, but much more frequently made to order, the details on which they were employed. The work of these last, being done with rule and compasses, was not capable of either losing or gaining much in execution. Such things as piers and buttresses, or even string-courses, arch-mouldings, and tracery, were, in all probability, designed, at least in the best class of work, by those who were most competent to the task, and these would rarely be the men who were fit for nothing more than to work them. Between the Mediæval architect and the modern one the main difference was that the former passed his time on his building, and had the power (without which he might as well have been sitting at an office table a hundred miles off) of modifying and improving it as it went on. Contracts and extras had not been invented, and so the first ideas of the designer were not obliged to be his last ones. The difference between the decorative workman of the Middle Ages and his successor of to-day was much more fundamental: the one could design, the other only copies. Whether anything can be devised, beyond the little that has been done in the last twenty years, to lessen this difference, is a point that may be considered in another article.

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SALISBURY CATHEDRAL AND ROMSEY ABBEY.

It is almost impossible to conceive a greater contrast than that formed by the two buildings of Salisbury Cathedral and Romsey Abbey, which happen to be such near neighbours. The Cathedral in question is a model of grace and prettiness, and though really upon a large scale and covering a vast site, it does not appear grand or impressive. It has a toy-like look amidst all its perfect proportions and lovely detail. Romsey Abbey, on the contrary, though far smaller, is unquestionably the grander of the two. The speciality of Salisbury among its cathedral compeers is that it is entirely composed in one style—that of the Lancet period, or Early English period of Gothic architecture. Early English this building literally is, *pace* Mr. Sharpe, as compared with its co-temporary buildings on the Continent, with which it has little apparent correspondence. As most of our readers will remember, this and the Cathedral at Amiens are said to have been commenced in the same year. The chronicles in this are particularly clear, William of Wanda having recorded that in the year 1220 the foundation of the present church was laid under Bishop Richard Poore, and dedicated in 1258, but the tower and spire are of a later date, and replace a lantern which was the original finish.

It is the exterior of Salisbury Cathedral, rather than the interior, which has attained for it its celebrity as an architectural work of art, while at Amiens the internal effect is, as it should be, paramount. Could a building be conceived which would unite the charms of each, it would approach perfection ; but with regard to all things earthly it would seem always necessary that there should be a compromise and sacrifice of some one thing to attain another. It is a pity that we now know nothing as to the pristine finishing feature of this pile we are describing, for the rhythm of all the original structure remaining is so remarkable that we cannot conceive but that it would have been not less harmoniously crowned, and yet without the soaring tower and spire Salisbury would be bereft of its principal charm. It must, however, be confessed that our own opinion, however treasonable, is that the proportions of these are somewhat at fault. The two stages of the tower, built at different dates, are too equal, and the great height of the whole slightly detracts from the scale of the rest of the structure, and helps to give that toy-like look to the exterior view of the Cathedral which we have noticed.

The absence of the usually numerous buttresses and pinnacles, and the prominence of the two transepts with that of the north porch, combine to give the simplicity with vigour of outline which are the striking excellences of the exterior. The detail, though excellent, is not remarkable, and the inferiority in consequence of the porch mentioned, to that in the similar position at Wells, is patent at the most cursory glance. The west front also, though intended as a *tour-de-force*, and for the introduction of sculpture upon a grand scale, falls far short of that of the Cathedral we have just named. The absence of western towers to terminate the wings of this façade renders their sham nature too evident ; they hide, but of course do not follow, the lines of the roofs of the aisles, and the sky-line of this square heap, broken only by the gable end of the nave and the small turret at either end, is poor in the extreme. We have, however, in England, so few attempts to introduce the sister arts with architecture upon so important a scale, that we gladly turn our attention to the details of this façade. Whether or not it be wise to attempt their restoration, as is being done, is, in our opinion, most questionable, and it is already most difficult to discern, between the few happily unrestored fragments of figures, those that have been (so-called) restored, and the new statues that are being placed, as funds permit, in the vacant niches. Ancient sculpture is too rare and precious to become so lost, and grievously as this façade has been mutilated, it was a better study for the architectural student before than since its restoration was commenced.

Originally there were 123 statues arranged in five horizontal lines stretching from north to south, and the figure of our Lord seated in a vescica-shaped niche in the summit of the gable above them. The grouping of these sculptures is in accordance with the verses of the hymn · "Te Deum Laudamus." In the first tier are represented the Angels, in the second Patriarchs and Prophets of the Old Testament ; in another the Apostles ; then Doctors, Virgins, and Martyrs ; and lastly, Worthies of the English Church. The few old figures are vigorously designed and *posed*, and those which Mr. Redfern, the sculptor, has added are fairly in keeping therewith, and as the work which he has commenced proceeds, the general effect intended by the designers of this façade will become manifest. It is, without question, far inferior to the splendid example at Wells, and lacks the concentration of that at Exeter. It is somewhat scattered and disjointed in design, and cannot for one moment be compared with the *chef d'œuvre* of sculpture and architecture combined in its rival at Amiens, a reminiscence of the entrance archways of which makes those of Salisbury appear, in common with most other English examples, sadly insignificant by comparison.

The interior of the Cathedral is narrow and not very impressive, the nave piers resemble those of Westminster Abbey, in their worst point—the setting of but four slender shafts round a central circular one ; but they are far smaller, slighter, and more flimsy in appearance. The effect is at best pretty, and with the contrast of its dark Purbeck marble shafts and light freestone, delicately coloured as it was, and with all its windows as once filled with the pearly and sparkling grisaille glass, it must have been charming, if not grand. Now the glare of light from the untoned windows prevents the full realisation of this. The choir seems bolder, but scaffolding at present obscures its proportions. It is in the hands of the decorators, who are said to be imitating with care the old painted ornamentation, of which sufficient remains existed to enable them to copy it accurately. We await the result with interest, mixed with some trepidation, for it did not seem to us that the drawing-room-like neatness of the portions of the work that seemed finished was either particularly attractive, or as vigorous as the untouched though faded colouring which met our eye in some places, and which, like all the rest of ancient work of the class we have seen, was sketched in with a bolder and freer style. The Lady Chapel beyond is altogether slight and delicate to an extreme, and the lack of manly vigour of design more striking than in any other part of the building. Salisbury is often quoted as the most perfect example of the graceful Lancet style ; it is so in its entirety, but not in its quality. Far grander work is to be found elsewhere, as in the nine altars of Durham, the transepts of York, the ruined portals of S. Albans, at Lincoln, Ely, and Llandaff. We cannot pass by without notice the beautiful octagon Chapter House, with its restored polychromatic sculpture, the general effect of which is refined and harmonious, though the prevalence of a washy blue and the glare of untoned gilding were, on closer inspection, somewhat unpleasant. It is sad to see that a considerable portion, fortunately of the less important work, is decaying from damp in the walls. The sculpture itself is rather rude and less excellent than that of the subjects in the voussoirs of the doorway that forms the entrance to this chapter-house from the cloister.

Romsey Abbey presents a startling contrast from every point of view from the type of work at Salisbury. Everything there is massive, stately, and grand, and the insertions made in the period of the Lancet style seem to have been of unwonted boldness, to harmonise in some degree with the earlier work of that of the Romanesque Transition periods with which it was assimilated. Unfortunately we have no such exact knowledge, as in the case of the Cathedral, of the precise period of its erection. There was originally a secular church here, of which parts may be incorporated in the Abbey, which was attached to the famed Nunnery of Romsey, in which Mary, the daughter of King Stephen, was an abbess. The exterior is plain but dignified, a simple cross plan on a grand scale with massive low central tower over the crux, but the interior is the more striking, and has several peculiarities of detail which seem to have a foreign origin. We cannot, however, now enter into a more minute description of the structure, but must content ourselves with having pointed it out from its character and position as a remarkable contrast to its more celebrated neighbour, and an example to show that it requires something more than bulk to attain architectural dignity, since in the cases we have referred to the smaller pile unquestionably bears away the palm, at least, in this respect.

THE DUDLEY GALLERY.

THE Exhibition which has just been opened for the season at the Egyptian Hall, Piccadilly, has for some years taken a prominent place amongst what are termed the Winter Exhibitions. Artists of undoubted merit have contributed, and others it would be gross flattery to call artists have sent in their quota of paint-spread canvas. In point of fact, it is well known in the artistic world that the Dudley Gallery is as much in the hands of a powerful clique, camarilla, or what you will, as the Royal Academy itself. With this our readers have no particular concern. They pay the customary shilling, and half as much for a catalogue, but they have a right to expect for their eighteenpence a show of pictures a trifle better than the semi-annual display of a young ladies' college or the competing national art schools assembled at South Kensington. The critic of the present day has something more to do than observe that the paintings would be better had the artists taken more pains, and the works of Peter Perugino scarcely need additional praise. That which first strikes the visitor is the great proportion of ignoble common-place subjects, barns, mudbanks, hovels, wretched without being picturesque, poverty without pathos, squalor commanding no pity. In the matter of mere dirt the leading artists are the most culpable. Without resorting to Madame Rachel, or the more crafty manipulators of the strigil and cosmetics of old Rome, there is an abiding belief amongst Englishmen that a lady should be as clean as may be. "Watching for the Return of Theseus" (70), by Mr. G. F. Watts, a group of four very uncleanly young people, is an example of all that is dirty in colour and bad in grouping. Next to the prevalence of ignoble subjects, the utter ignorance of linear perspective which nine out of ten of the pictures display is the most striking feature. Even sea beaches, with the tell-tale horizon to guide the eye, are not exempt from childish blunders. A view of a sea beach or meadow is usually taken from the beach or meadow, and the horizontal line to which the eye of every figure in an erect position should reach is coincident with the level of the distant sea or termination of the meadow. Hogarth, in a clever caricature, ridiculed the perspective of the painters of his day. Sweeping condemnation without instance is little to our mind, and it is difficult to dispraise works without in some measure condemning the authors. In one respect the artists are "wolf's head." No one compelled them to send their productions to the Dudley, but having sent them, they are, as far as free criticism may go, public property for praise or blame, according to their merits.

No. 4, a war scene, by Ernest Crofts, is excellent in tone and drawing. No. 13, "A Lantern Shop in Cairo," is about as bad as it conveniently could be. No. 19, an autumn scene, Field Talfourd, painted with almost incredible rapidity, is full of talent, firm, ready, sure handling. No. 18, Salcombe: too much foreground of uninteresting water. Nine inches cut off the bottom of this picture would improve it. It is astonishing how few artists have any idea where to stop the foreground. Claude framed his landscape at 40ft. of foreground, and Turner in his latter works did the same. His earlier works, more particularly his naval battles, are simply ludicrous, the ships being perched on walls of water rather than floating on a plane surface. No. 23 is a very clever painting, by W. H. Barrow, true to nature as a photograph, but wholly uninteresting. The great waves surge and break after the manner of waves, but there are no figures nor a single point of interest. "At Bay" (25), F. Slocombe, represents a leaguer out of luck awaiting the approach of a party of uncompromising enemies. The composition is good, and the tone quiet. "Midday in June" (32), R. W. Macbeth. Here is a girl trimming up rose bushes, a very harmless occupation, but scarcely worthy of being painted. It is, like dozens of others in the collection, without *raison d'etre.* "Symphony in Grey and Green —The Ocean" (37), Whistler. Mr. Whistler sends three companion canvasses, to wit—a "Symphony," a "Nocturne" in blue and gold, another in blue and silver, and which is the greatest impertinence it is difficult to decide. They are, one and all, without drawing, colour, or possibility. A whitewash brush is not an implement suited to the hand of an artist. These canvasses are simply silly, called by fanciful names. "Youth and Age" (51), is as neat a caricature as could well be devised. An old woman, bowed with years, is represented as having stature of at least 25ft., while a donkey foal, distant some 18ft., is nearly as large as a buck rabbit. Mr. Hughes can undoubtedly paint; it might be worth his while to learn to draw. To turn to No. 53, "An Elizabethan Rough," by Marks, one of the figures in his Academy picture, "Waiting for the Procession," is a relief. Here is drawing, painting, and character. A large picture, "At the End of the Reef" (65), Alfred W. Hunt, is not nature. A picture cannot be made without paint, but paint alone will never make a picture. No. 61, a pretty and carefully-drawn sketch of an orchard, by E. G. Dalziel, bears a strong resemblance to the style of G. Mason, who exhibits—or did exhibit, for he has passed away within the last few days mourned with more than ordinary sorrow—three characteristic pieces Nos. 329, 335, 342.

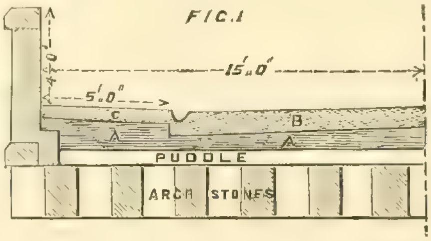
"Watching for the Return of Theseus" (70), by G. F. Watts, R.A. If Mr. Watts were a young and struggling man No. 70 would have been ignored in this review. Mr. Watts is neither one nor the other. He has simply chosen to send for exhibition a painting as injurious to his own fame as disagreeable to beholders. No. 71, "The Old Hack," Heywood Hardy, represents a cab and horse in the rain. A very clever picture, and though not poetic, has pathos. "A Winter Gale in the Channel" (82), H. Moore: this is a study for a larger picture. From Portishead to Penzance, from the Mumbles to Margate, channel gales have been familiar things, but in Mr. Moore's picture we fail to trace sign of channel gale. We never saw one composed of chalk, or even white paint. Why not in brimstone and treacle? "Autumn Love" (96), S. Solomon: poetic, classic, charming. No. 94, G. Prendergast, is true to life, but like so many others, absolutely without interest. "The Dilemma" (101), two girls on one side of a hedge, and a bull on the other. Grass is green, but not Paris green. "Anchor Harvest, Deal" (116), Leslie, represents the bold spirits of Deal fishing up anchors at neap tide. Losers are seekers, and hiders are finders. A hundred and twenty fathoms of cable and anchor hastily slipped in the Downs, and expensively replaced at Dover, is not an unknown quantity in the mercantile marine, but Mr. Leslie might have made men average more than three and three-quarters of an inch in height, and his horses might be bigger than rats. No. 126, Val Prinsep: Mr. Prinsep can paint well when he pleases; it is a pity he exhibited this picture. "The Rectory Gate" (129), E. H. Fahey: a lovely piece; a sleepy rectory approached by a bridge over a sleepy stream; a lady playing with a couple of peacocks on the parapet. Parson's daughter, undoubtedly. "Knole" (128), A. Ditchfield: excellent low tone Who does not know Knole, the most picturesque place within the same distance of London; artists always welcome, and the general public allowed to use the park as their own. No. 135, Calderon, is not up to his mark. "Young Corinthians Practising for the Games" (136), Talfourd: three giants aged about fourteen summers, a black dwarf ministering to them, and two brown dwarfs looking admiringly on. They are standing in a meadow, and, allowing for difference of stature for age, should all have been on the same line. "A Pastoral" (139), Mark Fisher: cattle; the scenery much like Hampshire, in the water meadows about Winchester. No. 150, Weigall, a poor thing, but his own. No. 169, portraits of Yeames and Wynfield, Calderon. This is described as a sketch. It appears to be a most carefully-executed picture, and the likenesses are speaking. "A Garden at Nuremburg" (200) is beautifully painted, but the figures are badly placed. "Orpheus and Eurydice" (216), Watts: this picture is unsavoury. We did once see a man nearly as dirty, but he had just issued from the cloaca in the Corso of Rome, and was about to cleanse himself before a fire in the Via Borgonone, close at hand. "The Heart of Dartmoor" (231), Chagford. No tree is blue green at any time of the year. 232, Briton Riviere: "Horses." No. 243, Mediterranean scene. Languid swell in knickerbockers: a superfluous painting. "Lions in Desert" (245), Riviere. Not equal to his wont. One lion in particular has been familiar from the box of toys of infancy. "Study of Spanish Bullfighter" (251), J. B. Burgess. The matador or espada is not the hero he appears to English imaginations. He is simply a cool hand of temperate habits. The headlong charge of the bull is evaded with ease and almost with certainty. Excepting Tatto's misadventure, an espada has scarcely been injured within the memory of man. No one better or more conscientiously depicts Spanish subjects than Mr. Burgess. "Andromeda" (283), J. R. S. Stanhope. A remarkable picture. The rock is not a specimen known to geologists, and the lady's hair is not at all recognisable as hair but for the fact that it seems to issue from the head. The drawing is good, and the flesh tints are natural, though not so clean as they might be. The countenance is wooden. "Whiting Fishing" (289). The waters under the earth have never been seen, but none upon the earth are like those which threaten to engulf the whiting fishers. The boats could not live in such a sea. "Pompey's Pillar" (319): hot and Eastern. "Carnations and Corn" (328), Leslie: in his usual graceful manner. No. 334, Walker, a design for a large picture representing a female at the bar, with the greatest anxiety depicted on her countenance. This is a very clever picture. "Our Village" (341), Leslie, is another admirable work. "Squall in an American Forest" (294), McEntee, is much in the style of Corot. The young Ludovici exhibits some promising studies. Severn has a charming Venetian scene, "San Giorgio by Moonlight." "Barnard's Inn, Holborn, in the Seventeenth Century," in the Flemish style (269), H. Wallis, and many others, deserve attention, but space does not allow a more extended notice.

BRIDGE ROADWAYS.—I.

IT cannot fail to have struck any one passing over a bridge, whether that bridge be intended for the purposes of locomotive or ordinary street traffic, that the character of the road laid over it differs from that adjoining it. If the bridge be a railway-bridge, the manner in which the permanent way is laid across it is different from that adopted in the open line. The way in which the sleepers are laid, the transoms, guard rails, and other details, have all special features of their own, but as our present business is with road and street bridges, and not railway-bridges, we shall not enter into the latter subject. There is one exception to this almost general rule. It is in the case of stone arch bridges.

In such instances, the ordinary roadway is usually continued unaltered in character over the bridge—at any rate, so far as the crust or top surface is considered. A change is, however, frequently made in the substratum of the road, and this change is one which must be introduced with caution. Every one practically acquainted with road making, is well aware that the efficiency and durability of a road depends quite as much upon the under as the top stratum of materials of which it is composed. In fact, the foundation of a road is the great point to attend to in its construction, and it is just the point where, from ideas of false economy, the grand mistake is made in the formation of roads. It cannot be too carefully borne in mind that if the foundation of a road is bad and defective, no amount of top dressing, if the term may be used, will compensate for the evil. Tons upon tons of material may be used in the attempt to consolidate the surface, but the endeavour will be futile. A road so constructed will be a dusty desert in summer, and a quagmire in winter. Numerous are the methods adopted by engineers and architects in forming roadways and footpaths over bridges, from the ordinary metalling and flagging to boarding the whole area of the bridge over with inch boards. This is the method to be adopted in the new Albert-bridge, as will be shown in a future article in the section of the roadway. But in order to employ some degree of order, we will commence with the roadway of an arch bridge of stone, an old type of bridge construction, which is fast becoming obsolete. In all probability, a stone bridge, similar to the London and Waterloo examples, will never again cast its shadow upon the waters of the Thames. The reason that very frequently no change is made in the character of the surface of a road, when it is carried over an arch bridge of stone, is probably due to the fact that there is no necessity for so doing. The great weight and inertia of the bridge itself, are sufficient to render it indifferent to the manner in which the load is disposed. There is no need, as occurs in cases where the arch is replaced by iron girders, to deaden the effect of a passing load, or, by the introduction of cross beams, to ensure a particular distribution of it. The solidity of a stone bridge renders it insensible to all those dangers arising from the force of impact which threaten the stability of its weaker brethren.

In Fig. 1 is represented a half-cross section of the arch and roadway as usually arranged in stone or brick bridges. In the present instance, the arch is supposed to be of stone, which is shown alternately in section and end elevation to point out that the coursing joints what is termed "break joint." Were this precaution not to be ensured in building a stone arch, there might occur a "straight joint" right through from one face to the other, a piece of workmanship which no competent superintendent would, for a moment, permit. On referring to the drawing, it will be seen that immediately over the arch stones—that is, over the extradosal surface of the arch—a layer of puddle, 6in. in thickness, is placed. This is one of the points in the question under notice which requires particular attention. A thickness of 6in. is quite sufficient to keep the arch watertight if it be properly laid on. This operation consists in thoroughly well punning and ramming it, until the whole layer has become completely incorporated. It must be kept in view that a comparatively thin layer of puddle clay, if properly manipulated, is infinitely more efficacious as a staunching agent than a large quantity improperly laid on. In a word, it is not the quantity of puddle which makes a good job, but the manner in which it is worked. If, as not unfrequently happens, a leak should be found to have taken place, and that the water trickles along the soffit of the arch, there is not the slightest use in adding more puddle in the attempt to staunch it. There is only one method of proceeding, which is to strip off the puddle in the neighbourhood of the leak right down to the crown, and do the work again. One thing is quite certain, that if the crown of an arch be not properly puddled, the water will, sooner or later, find its way through, so that the economical plan is to make a good job of it in the first instance. Although there is some latitude allowed in proportioning the thicknesses of the different layers or strata composing a road, yet it is acknowledged that the top of the puddle should not be nearer the surface of the road than 18in. It should be mentioned here that it is a common practice in the present day to substitute a layer of asphalte for the puddle. The advantages of this substitution are that an increase of headway is gained, as the thickness of the asphalte scarcely exceeds 1in., and there is not the same trouble and uncertainty attending the use of it. If the road be a metalled one, as it will be, unless it pass through a town, there will be a space to be filled up between the metalling and the puddle. This is shown at A A in the drawing. It may be filled up by any dry, hard material, and if not sufficiently hard, should be rammed, in order to consolidate it. Upon this foundation is placed the metalling, B in the figure, for the roadway, and the material of which the footways are composed. In country roads of an unimportant character the luxury of a footpath is dispensed with, but in others there are, if not two, at least one. The surface of the road is formed with a slight fall towards the side channels, so as to allow the water to run off. A very common mistake is to make this fall too great. One in thirty is ample. We have seen roadways constructed so as to look like veritable arcs of circles. One of the disadvantages arising from rounding the surface of a road too much is that it is in consequence very unequally worn by the traffic. It is evident that carts and vehicles will be driven over the flattest part of the road, which will, therefore, be the crown, and thus this portion of the road will be subjected to a much greater traffic and wear and tear than those parts near the sides. A very good form for the cross section of a roadway is to draw two lines at a slope of one in thirty, meeting at the centre of the road, and join them for a distance of 6ft. by the arc of a circle having a radius of 90ft., which will be practically flat, with just sufficient slope to allow the water to run off. To finish the surface of a metalled road in a proper and durable manner, the steam-roller should be used, and it is gratifying to witness that an increasing employment of this valuable machine is being made. The material for the footpaths, where flags are not used, is usually of gravel, if it can be obtained. But if it cannot, they may be constructed of any hard sound material that can be procured at hand. Ashes, cinders, and broken brick answer tolerably well in the absence of gravel. A very excellent footpath surface can be made with the fine red ballast which is procured by burning a certain description of clay, which is very abundant in most districts. The footpaths should have a slight fall towards the side channels. Other methods of constructing the roadways and footpaths of bridges will be treated of as we proceed. A parapet is shown in Fig. 1, which, by the regulations of the Board of Trade, must be 4ft. in height in every bridge coming under their jurisdiction. It will be found that, according to the character of the bridge and the nature of the material of which it is built, so will the corresponding features of the roadway vary, clearly indicating that for each especial case there is an especial description of roadway most suitable.



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A new clock and peal of bells, which have been made for the church of S. Peter, Walsden, by Messrs. Gillett & Bland, of Croydon, were dedicated by the Bishop of Manchester on Monday.

RICKETTY BUILDING IN LANCASHIRE.

A FEW years ago there was a transient indication of a desire to extend the provisions of the Metropolitan Building Act to Manchester and other towns unprovided with any enactment for compelling the safe construction of buildings. As respects their safety from fire, provincial structures are very far from requiring such legislative intervention as we do in the metropolis; but in the matter of stability—involving sufficiently thick walls, adequate foundations, and the like—it would certainly appear that Manchester and its neighbourhood would be all the better for some such legislative pressure as a Building Act. During the month of October, just ended, the local newspaper accounts of accidents from falling structures have been simply astounding. Insecure foundations, insufficient shoring, ruinous roofing, and other such defective works, would seem to be the order of the day in and around the City of Manchester. A cotton mill is burnt down, leaving some high wall so ill-secured that it falls on and overwhelms the adjoining premises. Here is such a case, recorded in the *Manchester Guardian*, under the suggestive heading

> Fall of Another Burnt Mill Wall.—About two months ago Bank Top Mills, belonging to Messrs. T. and E. Ogden, cotton spinners, were gutted by fire, the two side walls of the building being the only portion left standing. One of the walls fell a few days after the fire, but the other remained standing till a few days ago, when work was commenced to raze it. On Friday and on Saturday high winds prevailed, and the wall was observed to oscillate greatly, and, indeed, by some practical men it was said that it could not long stand in such a gale. At two o'clock on Saturday afternoon it fell with a tremendous crash, the height of the wall falling being that of four lofty stories. Close to the mill stands a beerhouse, and at the time of the accident eight men were drinking in one of the front rooms. One of them, named Squire Oldham, was seriously hurt about the chest.

In the same month we have another newspaper account of the fall of a roof in Manchester itself. By this casualty a woman lost her life under circumstances indicating singular *sang froid* on the part of the authorities. "The deceased," says the report, "lived with a man, named Bowden, in the garret of a house in a court in Spear-street. The house was in a very dilapidated condition, and Bowden had complained to the agent of the property that the ceiling was 'bulging' in. He could do no repairs to the house, and advised Bowden to leave it. On Friday night, about six o'clock, Bowden and the deceased were in the room, when the roof fell in, and the deceased was buried beneath the slates and rubbish. When taken out she was removed to the Infirmary, where it was found that she was dead. A nuisance-inspector said that in the performance of his duty he visited the house about fourteen days previously, and that Bowden then pointed out to him the 'bulging' in of the roof. Witness, however, saw no reason to anticipate immediate danger, or he should have reported the house. John Ball, building inspector, said he had visited the house. The cause of the accident was the giving way of the bearing timbers of the roof, probably from dry rot."

Now, an accident like this, were it to occur in London, would be certain to bring down a good proportion of the metropolitan press upon the heads of all the survivors concerned, with a running commentary on architects and architecture; albeit there is little enough of either in the construction of a London dwelling-house. We will close our extracts from these October newspapers with the following paragraph, recording the fall last Friday, 25th ult., of no fewer than half a dozen houses in Salford, a portion of the Manchester district:—

> Fall of Six Houses.—Yesterday six houses of a row of nineteen, in course of erection in Salford, fell to the ground, burying several of the workmen. Six were more or less seriously injured, and were removed to the infirmary. The recent flood had undermined the foundations.

These floods are anything but uncommon in Manchester, and sites likely to be affected by their recurrence would naturally demand some constructive precautions. Were any taken? Was there even a bed of concrete to withstand this uprooting of the foundations?

ARCHITECTURAL ASSOCIATION.

THE opening *conversazione* of this Association for the present session took place on Friday evening last, at No. 9, Conduit-street, Regent-street. The walls of the large gallery were covered with, among other things, several very fine water colour drawings of the Yorkshire abbeys and priories, by Mr. R. Phené Spiers; and a very fine series of photographs by E. Wormald, of Leeds, showing to a very large scale such buildings as York Minster, Southwell Collegiate Church, S. George's Church, Doncaster, and the Leeds Town Hall. Several of the competition designs for the following buildings were exhibited:—S. Ann's Heath Asylum, Spalding Mechanics Institute, Camberwell Vestry Hall, Stockton Exchange, and some of the competitive designs for the following schools for the London School Board:—Johnson-street, Stepney; S. Paul's-road, Bow-common; and Blundell-street, Finsbury. Messrs. Green & King exhibited several designs for decorative works, and some paper-hangings. Messrs. Cox & Son sent specimen articles of church furniture and plate, and a portion of the National Music Union's challenge prize (illustrated in last week's BUILDING NEWS); and Mr. Robert Minton Taylor exhibited specimens of wall and floor tiles. The usual screen, with selections from the Architectural Association Sketch Book, was absent. Several nominations for membership having been made, the prizes offered by or through the Association during the past year were distributed, after which

Mr. J. DOUGLASS MATHEWS, the President, then made the following remarks:

ON THE RELATION OF AN ARCHITECT TO HIS EMPLOYER.

The position of an architect as an artist having been the subject of the address at several meetings like the present, I propose to vary the theme this evening by offering a few remarks on the relation of an architect to his employer. I accept this course the more readily because I shall have an opportunity of addressing the members next week, and judging from the severe strictures that have been passed on architecture and architects in the public press during the past few months, there is evidently a misconception in the public mind on the subject. At the outset I may remark that although the prominence which has been given to the architectural profession has not been as flattering to us, its professors, as might have been desired, I nevertheless think the criticisms to which we have been subject will be productive of good. We, at any rate, know what the public consider to be our faults and failures, and must either justify them or admit our errors, and address ourselves to the correction of them. Much of the blame cast upon architects arises from their having to serve two masters, the public and the employer. The first arbitrarily claims a perfect work of art, making no allowance for circumstances or special difficulties, and not unfrequently the critic's own taste is put forward as the true and only standard of excellence. Then others, possessing little architectural knowledge, and having strong predilections for some particular style, join in condemnation or disparagement, so that the bewildered architect, after a little experience, gives up all idea of *satisfying* the public. The utmost that he can do is to prepare a design suited to the requirements of his client, and that will be accepted by those who are recognised authorities on the particular style he may adopt, even though it may not possess, in their estimation, ideal excellence. But I cannot suggest this spirit of independence towards the other master, the employer, to whom the architect is bound to listen. He may have the good fortune to please both, but at all events he has first to study the requirements of him for whom the building is to be erected. It not unfrequently happens that the employer has determined in a great measure what he requires before he consults his architect, and even presumes to select the style in which the building is to be erected. He sees no reason why he should not have his opinion upon this as well as upon his pictures or furniture. This is often at variance with that of the architect. If he is one of those few who consider that as artists they have a right to dictate in matters of this kind to their clients, his first impulse, in case of non-compliance with his views, is to throw up his commission. If he has arrived at that eminence in his profession that to adopt any other style than that in which he is in the habit of designing would be to sacrifice principle to emolument, he would be fully justified in this course, and to be commended; but a young architect cannot be expected to take up a position so authoritative and independent. He may have difficulties to contend with unknown to an outsider, and may feel constrained deliberately to deny himself the luxury of public praise. But in the end he will have the satisfaction of knowing that he has considered the interests of his employer, and in so doing may have proved himself a true artist, if Art is, as it should be, the outcome of necessity. Although these remarks may appear hardly such that an artist should advance, it must not be forgotten that we are public servants, and that if we have scruples (and justly so), there are those who have no such obstacles, and who are quite ready to accept anything offered. Therefore, in our own interest, as well as in that of our employers, it is surely our policy to look at things in their real light. At the same time our thanks are due to those who are endeavouring to educate the public to an appreciation of art, which will, of necessity, create a demand for artistic, as well as utilitarian designs. Passing from the consideration of apparently conflicting interests, allow me to offer a few observations on those points upon which no other interest than that of the employer has to be considered. Fitness of purpose is, or should be, the starting point in design. In other words, the elevation should grow out of the plan instead of the plan out of the elevation. To this end the requirements of the client must be fully studied in all their details, and the plan so arranged in all its parts that it may be thoroughly convenient and suited to its purpose. Skill herein will do more than anything to enhance a client's opinion of an architect's abilities. The want of proper instructions and confidence between the one and the other is the cause of much misunderstanding between them. In some cases the accommodation required is given to the architect, and nothing said about outlay. The design is approved, but when the cost is ascertained it necessitates a reduction, and probably, in so doing, many of the chief points of convenience have to be omitted. In other cases the amount intended to be expended is named (oftentimes given only as a guide), and to keep within which the accommodation has to be limited, and after the building is commenced, has to be provided at a considerably increased cost than if at first included. It would be much more satisfactory if, in all cases, the employer were to take the architect into his confidence, and inform him of his full intentions and wishes. The general design having been determined upon, the architect has now to consider the general construction of the building, the materials to be used, and the arrangements in their several details, together with all provisions necessary for the commencement of the work. In the ordinary way this is exclusively his business, but in order to be fully successful he must be conversant with all the modern improvements, which, in these days of invention, is no easy matter. It not unfrequently happens that his attention has been called to a recently-invented material or appliance, and although tolerably satisfied in his own mind as to its utility, he yet feels some timidity in adopting it, for, unlike the engineer, who, on account of the magnitude of his work, has opportunities of making experiments and tests, no such latitude is allowed to the architect, and in case of failure, the blame will fall on him. In instances of this kind it is only fair that the employer should be consulted, and the matter in all its bearings laid before him. If this were done, the architect would be more ready to investigate the several appliances which would lead to greater comfort and economy in building. At the same time, I am not unmindful that there would be considerable difficulty in this course if the conference with the employer is to release the architect from his responsibility. Advice, however, is often most required on those subjects with which it can hardly be considered part of an architect's duty to be fully conversant. There are few of the arts and sciences that are not called into play in an architect's practice; that he should have a general knowledge of most of them, and be able to offer advice, is to be expected, but to hold him responsible as an adviser on subjects upon which doctors differ and professors are at variance, is unreasonable, and I venture here to suggest that if there were more communion of one profession with another, much good would ensue; and also that if, in matters of doubt or imperfect knowledge, the architect were allowed to consult an expert, as a solicitor does a barrister, or a general practitioner a physician, the public would be great gainers. The construction of the building should be left wholly in the hands of the architect, and for this he must be responsible. He will take care that while building in a substantial manner, he does not use materials of unnecessary strength, or in an useless manner, to the detriment of his client's purse. In these days of competition and independence, the superintendence of the building in its progress is a serious matter, and a source of much worry and anxiety to the architect. Up to this point he has all the work pretty much in his own hands, but now he is dependent wholly on others. He must, of course, prepare his drawings and specification in such a way that each tradesman may know what he has to do. He must also have a knowledge of materials and manufactures, to enable him to properly superintend the work; but notwithstanding all precautions, mistakes are constantly occurring through the carelessness (or, I was going to say, wilfulness) of the workmen employed. When it is remembered that it is constantly enjoined on the English workman that his duty is to do as little as possible, and that efforts are deliberately made by trade societies to keep the best workmen on the same level as the worst, it will be readily seen that having no credit to gain, *his* interest is small, and the result is dissatisfaction and discontent on all sides. Until the workman can be made to feel that he has a personal interest in his work, and that the more he does and the better it is done the greater will be his reward, we fear the present state of things will not be much improved, and the recent strike does not lead us to hope for much. Anything that architects as a body can do to bring this about they gladly will, as so much of the success of their work depends on the care and skill of the workmen. The want of these causes much blame to be heaped upon them which is wholly undeserved; they have already enough to answer for, according to their critics, without being held responsible for the sins of every manufacturer and workman employed on a building. The same remark applies in a great measure to manufactured articles. Formerly, the name of a firm was a sufficient guarantee of the quality of its commodities, but as a consequence of the system of close competition, inferior, and oftentimes faulty, articles are supplied. Indeed, it has now become a difficult thing to procure what may be termed perfect manufactures. This is much to be regretted, as the English workman will lose his credit for perfection and skill in the finish for which he has been renowned. In reference to the business qualifications of an architect, I will only say that as the employer places himself entirely in his hands, he has a right to expect in return the strictest integrity and the exercise of the utmost care and ability. And now, having seen what are the duties and responsibilities of our profession, we will consider briefly what is being done towards fitting its members for the exercise of it. Unlike most other professions, we have no complete and regular course of study. It is true that the Royal Institute of British Architects has established examinations; these, however, have been but moderately successful, owing, doubtless, to the want of a properly-organised system of study, but I am glad to be informed that important alterations have been made to suit the convenience of those who propose to be examined. To students engaged in active work during the day, the enforced attendance at lectures becomes somewhat irksome, and where pleasure and work can be combined, there is no doubt the result is more successful. Nowhere can this be done more than in this Association, where the members meet, not only as fellow students, but as friends. This greatly increases the interest taken in the work, and creates a wholesome emulation. The means adopted are briefly as follows: Lectures at the ordinary meetings on subjects of general use and interest, followed by discussion; a Library, which is steadily increasing, and, being the only circulating architectural one, is of great value to students, giving to them advantages that no reference library could supply; Classes for instruction in drawing from the flat, round, and figure, perspective, and water colour painting; Classes for design for the elder and younger members, at which members submit sketches prepared beforehand—these are criticised in a free and friendly manner, those in the elementary class by some of the senior members, and those in the advanced class by their fellows; a Class for instruction in practical subjects, to be conducted on a similar system to that of elementary design; Prizes to promote zeal in the classes and encourage research; also critical study of ancient buildings by making measured drawings; designing large buildings; in essay writing; The Sketch Book, which forms an incentive to sketching and noting those objects of interest which present themselves frequently in a summer tour, and at the same time is the means of imparting much interest to those who have not had the opportunity of visiting the localities in which the sketches have been taken; a Summer Excursion, during which a considerable number of churches are visited, and opportunity thereby afforded of comparing one work with another in the same locality, and minutely tracing the developments of the art in its several periods; Visits to buildings in progress, which give the members the advantage of inspecting the construction of large and important works in a way that would be otherwise impossible; a course of lectures on professional practice, by which the younger members will have the benefit of the experience of one much their senior; classes for instruction in chemistry and geology, with especial reference to the relation of these subjects to building materials; and also a class for land surveying and levelling. Such is the work before us for the present session, and such, with some exceptions, has it been for years past. That the Association is appreciated is testified by the steady increase of members, now numbering between five and six hundred, the greater part of whom are students and junior members of the profession. As to the results, in the face of the severe criticism to which reference has been made, it is difficult to speak with certainty or confidence, but considering the number of what may be termed successful practising architects who in their early days took an active part in the working of the Association, we may venture to say that if the practice of our art is not satisfactory now, it would have been far more unsatisfactory if no such means had been afforded. I have only to add that I trust it may not be thought that we, as architects, are shirking our duties and responsibilities, or are self-satisfied. I can assure you an architect has no more severe critic than himself, and we only ask of the public that the confidence and forbearance with which other professions are favoured may be extended to us. We feel assured that in that case there will be little cause for complaint and mistrust; but architecture will once more assert herself as of old, the senior of the three sisters, Architecture, Sculpture, and Painting.

Mr. T. **Roger Smith** having been called upon for a few remarks, said: We have, I think, to thank you very much, Sir, for the observations you have made to us upon the practical conduct of our professional career, and I cannot but feel glad that you have touched upon the question of those adverse criticisms under which some of my brethren seem to feel rather sore. I cannot say that it seems to me a matter of regret that some hard things should have been said. To a certain extent, when we are found fault with there is no doubt a margin of truth, from which we may gain advantage; and I am quite sure there was a very large admixture of error, which may prevent us from feeling too severely that we are labouring under the blame of a really wise and intelligent judge. (Hear, hear.) I have yet to learn that the man who believes that the great reformer of architecture is to be the British workman is a judge worthy to be very much appreciated. (Hear, hear.) I have yet to learn that the hope of the future is that congeries of workmen coming one after the other upon a large work shall manage to muddle out something which shall be harmonious and satisfactory as a whole. Nor do I think that the course which events are taking tends very much in that direction. It seems to me, as far as the changes which are going on around us can be appreciated, they make larger demands upon the efforts of individual men and the powers of individual designers. Only to-day we read in the *Times* of the vast speed with which a large amount of work has been carried out in Chicago, in the rebuilding of that great city, at a pace which is understood to equal one building an hour for the last nine months. Fresh opportunities of this description of work are occurring from time to time, and whenever a gap has to be filled it is filled very rapidly. It strikes me that works of this kind can only be carried out under the direction of one or two men, competent to grasp all the bearings of the works, and not by a large number of men, each contributing a small portion of the design. What is really wanting is that we architects should fit ourselves to do large works with rapidity and success, and with that grasp of the materials placed at our disposal which only careful cultivation and active work can give. We live in a day when the steam-engine and the manufacture of iron and glass have placed entirely new resources in our hands, and it appears to me that what is demanded of us is that we should be prepared to execute works in which these new resources should be carried to their full extent. I fully appreciate the force of what Mr. Mathews said about new inventions. The responsibility of introducing them is very great, and as a rule, whenever a client proposes some untried novelty, I endeavour to beat him out of it, and generally feel that I have done him a service. (Hear, hear.) These are, of course, very useful novelties, and there are advances constantly being made in the science of construction.

Professor **Kerr**, after a few introductory remarks, spoke as follows:—Allusion has already been made Sir, by yourself and my friend Mr. Roger Smith, to what you are pleased to call the severe criticisms that are being passed upon the profession in England at the present day. Now, I have always spoken plainly to this society, and I believe that what little appreciation you have exhibited towards me has been dictated mainly by the fact that I *have* spoken plainly. Let me change the term, and, not to speak of severe criticism, speak of remarkable unpopularity. The position of the architectural profession in London at the present moment is most critical. The unpopularity which we enjoy is altogether unprecedented. I believe that no profession of modern times has ever stood in so unpleasant a position before the public as we do at the present moment, and it becomes a question for the most serious investigation on the part of those who are older—more particularly on the part of those who are younger and have yet the battle to fight—what may be the actual reason and effect of this unpopularity. It is vain to attach any blame to individuals. Individuals make no impression, or very little, upon the course of architecture. The profession or the art of architecture, call it what you will—the business of architecture, if you like—is a thing which in modern civilisation holds so peculiar a position that individuality sinks into nothing compared with that course of predestinated success or non-success which attends upon every fresh development, lending new interest to every page of the story, and contributing in every page a fresh exhibition of human intelligence and human intellect. (Cheers.) Let me speak for a moment on what I will venture to ask you to permit me to call "fashion in architecture." I know that it is an unwelcome word. I know that you are accustomed here to speak of the prevailing style of the moment as no mere fashion; but, considering the prevailing style as a mere fashion, what do we find in England at the present time? We find that in previous fashions in architecture the tide has flown upwards to a certain point, and then it has turned and flown downwards, and that which at one time was thought to be destined to be perpetual, has become forgotten and a mockery. Now, I say that the present fashion in architecture is destined to follow the selfsame course that others have followed. I know that this is a most unpopular sentiment, but I will wind up my remarks by a practical application of them. I am old enough to remember when the previous fashion to the present was at the flow. I am old enough to remember every step of its ebb, and to remember every step of the flow of the present fashion, and I believe that the unpopularity of the profession at the present moment is a mere phenomenon showing that the tide is turning (laughter and "hear, hear"). When the tide is at the full, when the wavelets leap jubilantly, as it were, and the waters cover the whole surface, there are little corners and crannies which remain quiescent, or in which the water seems to be flowing the other way, and on seeing which one says, doubtfully, "The tide cannot have turned!" You place some bagatelle upon the surface, and by and bye you see it floats downwards, slowly at first, but presently a little more swiftly, till at last it is hurried away and forgotten. Now the jubilation of the waters is what some of us think is taking place at the present moment. The little discords—administrative discords, significant discords—which take place in our profession at the present time, are the uncertainty as to the state of the tide of which I spoke. There is apparent, not only in the minds of the opponents of the present fashion, but in those of many of its upholders, a strange element of uncertainty and change, as though there was a longing for something different. The tide shows a predisposition to alter its course, it knows not whither. I am not depreciating the Gothic school; I am not depreciating your hobby, if you will allow me to call it so (laughter); I am only pointing out that the present fashion in architecture must, like all other things, flit away. If it is as I suggest, then I venture to say to the young men who form this society, Prepare for the change! How is that to be effected? There are two suggestions I would venture to take the liberty of making, of a practical kind. I consider that the great fault which lays against us, and more particularly the younger men amongst us—and it is a fault which I am happy to say involves great honour—is that there is too much pure and simple draughtsmanship. The draughtsmanship of the younger members of the architectural profession at the present day has never been approached in the world before. French draughtsmanship I will not speak of, for it is another thing altogether. I have seen this perfection in draughtsmanship rise step by step from the time of Pugin and the beginning of what is called the Gothic Revival, and I have always maintained that the art of the Gothic school, and the representation of that art in draughtsmanship, are what England ought to be very proud of. But architecture does not end on paper, and if young men confine their studies to the paper work of architecture, they will fail when it comes to the stone and mortar work. (Hear, hear.) Therefore, without asking you to cease studying drawing and to cease making drawings, let me just give you this counsel: Why not (instead of studying drawings exclusively) study photographs of buildings? The art of photography has become developed to such an extent that you can have before you any building in the perfection of its actual effect. Why not place such photographs as are now on the walls before a critical class, and call upon the members to criticise the building or the portion of a building (as the case may be) on its merits, and without reference to reverence for the past? Although I am a youngster, I venture to differ with the architect of York Minster (laughter). I know that there is a majority of young men here quite capable of differing with their predecessors (laughter), and why should they not, if they can give reasons for the faith that is in them, right or wrong? Now *that* is the study of architecture. Let me advise you to study photographs of buildings critically, and not to rest content with studying perspectives, drawings, and sketches. There is another thing I would say. If it be, as I suspect, that the tide is turning—and if it is we cannot help it: it is vain to oppose it—the younger members of the profession had better be a little more eclectic in their studies. There is nothing easier in the world than to confine one's attention to one small page of a book, but it is a much more difficult thing to begin at the beginning and know all the pages. There are many pages in the book of architecture, and a good many pages that are well worth study. Would it not be well to study a few of these?

Mr. **Street**: I might, if this were a debating society, with perfect fairness and with a considerable amount of ease, accept the challenge which has just been given; but when Prof. Kerr prophecies the advent of a disastrous time for Gothic, one evidence upon which he goes being that the younger members of the profession have arrived at a great pitch of excellence in one of the most important branches of our art—such a pitch of excellence, indeed, as he has never seen before in his own experience—I don't think that you, the junior members of the profession, need trouble yourselves much at his evil auguries for your future. From an inspection of your drawings hung in the other room I am pleased to see that they contain much evidence of the advantages of this Association—evidence of extreme skill, not in mere draughtsmanship and in the art of design, but in construction and planning. Some names quite new to me promise to attain distinction in time to come. One advantage of our profession is that every man with energy and taste, and who adds to that a determination to work, has, in one sense, his Field Marshall's staff in his hand; and in spite of what we have just heard, I confess that my experience has never been, my experience is not now, that I belong to an unpopular profession. If I might give any counsel at all to our profession, I would say that what little bad repute we are in comes rather from the exaggerated system of criticising each other which prevails amongst us, and which does not quite obtain in other professions (hear, hear). Painters enjoy each other's works, although sculptors detest the productions of their fellow artists. I think, however, that this Association and others like it will do much in correcting this evil by bringing together, while they are young, those who will be in due course the senior members of the profession. I can hardly say how delighted I am to find that at last we have a style, and that I have the satisfaction of knowing that that is the style to which I have attached myself. If I might venture to suggest to you one rule for success, I would say, until you have mastered one page of a book do not turn to the next. It is perfectly certain that a man who skims a book and fancies he knows all its contents does not know so much of it in the end as the man who endeavours to master it bit by bit, and so it is in architecture.

Mr. T. H. **Wyatt**, President of the Royal Institute of British Architects, said that personally, and as the representative of the Council of the Institute, he congratulated the Architectural Association on commencing, under such favourable auspices, another session. He advised its members to persevere with their studies, and not to leave go of one rung of the ladder until they had hold of the one above.

This concluded the speech-making portion of the programme of the evening.

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Three wings of the new Holy Trinity Certified Industrial Schools, Toxteth Park, Liverpool, were opened on Thursday week. Messrs. Statham & Blease are the architects, and Mr. Henshaw the contractor.

A very fine mass of beautifully sculptured cornice has just been discovered at the Prætorian Camp, and all the Roman archæologists are in a fervour, writes the *Echo* correspondent in Rome, expecting still further revelations of great importance.

THE EPHESUS MARBLES AT THE BRITISH MUSEUM.*

WHEN we last wrote, says the *Pall Mall Gazette*, the best part of this consignment was on board ship, and could only be judged from very imperfect photographs taken on the spot and sent in advance. The fragments have now been for some time unpacked, and the most important of them arranged for public inspection among our other treasures in Great Russell-street. Much better photographs have also been taken of them since they were brought home—photographs, indeed, very excellent in parts if very inadequate in other parts, according to the nature of that invaluable but provoking appliance. These have been published by Messrs. Mansell, of Percy-street, both separately and as a portion of Mr. Charles Harrison's great enterprise of a general museum series—an enterprise to which it will be our business to do justice before long.

The principal fragments, as set up in the public galleries of the museum, are five in number, two being strictly architectural fragments, the other three fragments of architectural members adorned with sculpture. The former are, first, the base mouldings of one of the great columns of the building, with the bottom part of the fluted shaft itself; second, a vast Ionic capital of one of the same columns. The unfractured faces of these pieces are in beautiful preservation, and will serve the architectural student to construct pretty completely the details of this phase of the Ionic order, as employed on its grandest scale and with its most elaborate finish in the chief Ionic building of Asia Minor. The capital especially is an unsurpassed example of the bold and subtle modulation of line and exquisite manner of carving in the best Greek architectural work, and is as much finer as it is huger than either of the other Ionic capitals from Asia Minor—that of Halicarnassus and that of Priene—with which the student will naturally compare it. Passing on to the sculptured fragments as being of more universal interest, we find two important masses which have solved past all doubt the equivocal phrase of the *cælatæ columnæ*, used by Pliny in his description of the temple's glories. These masses exhibit sculpture in relief applied to an architectural member upon which its application was previously unknown to us in Greek art—that is, to the bottom portion of the shafts of columns. There were known several coins of the Roman Empire bearing on the reverse an abstract likeness of the famous Ephesian temple. These showed a roughness about the lower part of the portico shafts, which, it was plain enough, must indicate the same thing denoted by Pliny's *cælatio*. And in the finest of them, a coin of Hadrian preserved in Paris, the roughness resolved itself pretty clearly under a magnifying lens, even without further evidence, into a tier of figures carved round the cylindrical circumference of the shaft. And now we have recovered two slices of shafts carrying exactly such tiers, so that the matter is put henceforth beyond dispute. Nay, it is remarkable that in the representation on the coin of Hadrian there is to be detected a figure carved upon the left-hand corner column, seeming to correspond in gesture and attitude to a figure of Mercury, with his wand and travelling hat, or petasus, which is one of the best preserved among those actually occurring in our two fragmentary tiers. The tiers adorn separate drums—certainly in one case, and probably in both, the bottom drums—of columns. These figures round about the drums are life-size, in moderately undercut relief. One drum is broken across at waist height of its figures, the other has its whole height; both are so split and fractured as to show only a small portion of their circumference intact. The one having its whole height shows four figures nearly complete, with indications of several others. Archæologists will find it no light problem to recognise these and name them. It is a procession or congregation of gods and goddesses; but which, and how occupied? The aforesaid Hermes is obvious enough; he stands in profile looking upward to the right, with his left hand on his hip, and a short cloak hanging from the left elbow, the caduceus in his right hand, and the petasus slung behind his neck. His head is thrown back as if in the gesture of receiving a message from some superior deity (compare the attitude of Iris in the "Apotheosis of Homer," in the next room). To right and left of him stand draped figures of goddesses in full front, one of them holding in her hand a broken portion of a quite unrecognisable attribute, the other destitute of any attribute at all, and both headless, while the head of Hermes is almost intact. Farther round from Hermes on his left (the spectator's right) come the draped knees and sandals of a seated figure. Farther round on the right of Hermes (the spectator's left), and looking towards him across one of the full-front goddesses, is a figure of much beauty and not a little ambiguity. It has an immense pair of wings, and is naked but for a baldric and short sword; it has soft fully-rounded limbs, between girl and boy. You perhaps say at first sight, "Nike," Victory, by the wings and sword; but then the Greek Victory is always an unmistakeable woman, and almost always draped. Then you say, "Eros," Love, for Love has wings too, and often these large ones, and he is commonly naked; but, again, he hardly ever wears a sword. The probabilities, we should say, remain at last in favour of Eros, in one of his ambiguous or androgynous types, as an effeminate winged youth. Or the figure may be some obscurer dæmon or physical or local personification. The antique that most closely resembles this one seems to be a bas-relief discovered in some diggings of Prince Torlonia at Rome in 1830, and published by Gerhard (Akad. Abhandl., pl. xxxiii., Fig. 2). Gerhard calls the figure of that bas-relief an androgynous Eros of the Roman period; and his attitude and design, as far as one can tell by the plate, almost exactly resemble those of the Ephesian relief now before us. But there can be little possibility of his belonging to a later period than the Alexandrian restoration of the temple—the latter half of the fourth century B.C.; as, indeed, the head of the figure, in its peculiar roundness of contour, fullness of lips, drawing of eyebrows, and charm of expression, evidently belongs to the beautiful type of head found in the Mausoleum and other Ionic monuments of that century.

The other drum, that which is broken off about waist height, shows draped figures, presumably also figures of divinities, alternately standing erect and seated on short pilasters over which draperies are cast. They are not complete enough to be individually susceptible of even hypothetical recognition.

The third fragment carved with figures is not from one of these enriched main columns of the temple's front and rear. It is the corner piece of a frieze, from what part of the building we have no means of telling, and carries figures of full life-size and of bold projection, in a very white marble. The subject is Hercules (or Theseus, for both at times carry the lion's hide badge) in conflict with an Amazon. That is, of course, one of the commonest of all subjects for friezes in constructions both of Dellas and the Hellenic colonies. But the motive would have a peculiar significance here, and would carry back one's thoughts to the origin of the Ephesian polity, if, as recent historians suggest, the mythic warfare of Athenian and Amazon were, in its historical germ, but a reminiscence of primitive conflicts between colonists coming from the Hellenic mainland and religious institutions already established on the soil, like this Ephesian one, with its settled organisation and its defensive army of virgins consecrated to the goddess.

While the curators of all nations envy, and spectacled science performs its grateful pilgrimage, there are voices at home that talk in somewhat random depreciation of these remains of architecture and relief sculpture from the Ionic coast of Asia Minor, which—being, indeed, the only remains of the buried Hellenic civilisation now accessible to enterprise—have formed the staple of our acquisitions in late years. One hears the word "decadence" used in relation to works that belong to the Greek schools of the fourth century, the schools of Scopas and Praxiteles, or the school of Lysippus; one hears these acquisitions spoken of as if they were of slight value; or else it is said that reliefs are a small matter, and sculptures in the round what we want. As if the restored Greco-Roman Apollos or Venuses in the round, that form the admired staple of Vatican and other famous galleries, were worth a tithe, either for history or for art, of what the least of such defaced and corroded reliefs from Asia Minor may be worth. Those, in the immense majority of cases, are but weak imitations of imitations, the examples of a real decadence and its spirit, even if full of beauty even in decadence. These, on the other hand, are original fragments of schools which, if not as great, in the noblest sense of the word, as the ideal schools of the preceding century, constituted nevertheless much rather a new phase than what can properly be called a decadence in the development of Greek art. That they are generally fragments of decorative or architectural and not of independent sculpture, is so far to their loss. But the great original examples of independent sculpture are destroyed; and these, and such as these, are the best and nearest approaches to them that we can now get. It is too early, and the fragments are too unique, and the authorities too vague, for a quite confident judgment to be at present passed as to the school and epoch which must be assigned to the particular acquisitions now in question. But, while their historical value cannot evidently be overrated, their artistic value is considerably greater than has at present been recognised. They belong to a school of design which is full of genius as well as of skill and training. The progress, or descent, from the ideal and divine to the ideal and human has manifestly begun, and the figures already reflect a good deal of the natural model. But that the execution of them is beautiful, and complete so far as its decorative purpose comports, can be perfectly well seen beneath the more or less corroded and discoloured surface of the marble. The figure of the Hermes, the figure which is like an androgynous Eros, have not, indeed, the austere perfection, the supreme distinction, the augustness, of the Phidiac period; but they are radiant with the true Hellenic charm and poetry. The draperies of the standing goddesses, and that which depends from the arm of Hermes, are hardly anywhere surpassed for natural skill of disposition and expressiveness of carving. The management of the relief of the figures upon the cylindrical surface of the column is a triumph of the Greek instinct and Greek training in these material problems of the art. One sees how admirably the decorative effect has been conceived for chiming in with the structural effect, in the way in which the draped limbs, alternating with draped pilasters, approach (on the drum broken low across) the effect of columnar flutings. It is, perhaps, on this fragment that the finest individual specimens of work may be pointed out. All its draperies are admirable; and look how subtly, in one place, the bracelet of an arm has slipped down as the hand is leaned upon a pilaster top; in another, how infinitely cunning and tender is the carving of a foot and the folds about it. Or, on the other drum, one may point to the hair of Hermes as a very high and expressive kind of chisel work indeed, or to the outspread wings of the figure of ambiguous sex as a piece of splendid design, in a spirit which is only second to the most perfect and most disciplined of all. The workmanship of the corner fragment with its Amazon motive is, we should say, at once coarser and stiffer than that of the others. And thus much said, we must close a subject which should be full of interest for such as care even a little and vaguely about these things.

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* See Building News, p. 159 and p. 457, Vol. XXII.

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CHIPS.

A petition has been presented to the Court of Chancery for the winding up of the Commonwealth Benefit Building Society.

A new Town Hall has been opened at Leslie, N.B. The cost is £1,000, and the building will seat 800 persons.

A new marble font is about to be placed in Christ Church, Clifton. Messrs. G. Porter & Co., of Bristol, are the sculptors.

In the class of "Silk," which forms one of the industries selected for next year's London International Exhibition, it is proposed to admit specimens of sewing and embroidering machines which possess special features of novelty and excellence in the working of sewing silks upon different materials.

Mr. Thomas Howard, of the King and Queen Ironworks, Rotherhithe, who was for thirty-seven years an Associate of the Institution of Civil Engineers, has bequeathed to it the sum of £500, free of legacy duty.

A series of lectures on the Elements of Physical Science will be delivered in the Lecture Theatre of the South Kensington Museum, by Professors Duncan, Carey Foster, and Rutherford. The course will begin on Monday, the 11th November.

The works at the S. Gothard tunnel are being energetically pushed forward. Sufficient progress has been made to allow dwellings for the workmen to be erected in the openings already formed, protection being thus afforded against the inclemency of the weather. The powerful steam machinery for piercing the mountain is shortly expected to arrive on the works.

An important patent trial which has been for some time pending in the United States with respect to Messrs. Ransome's Patent Artificial Stone, has been at length decided in favour of Messrs. Ransome, Bessemer, & Ransome.

S. John's Church, Old Haymarket, Liverpool, will be reopened on Sunday next, after restoration. The interior has been reseated, the altar elevated, a new pulpit provided, and several minor improvements effected.

The subject of Mr. Ruskin's forthcoming series of lectures at Oxford, as Slade Professor (to commence next week), will be "Sandro Boticelli and the Florentine Schools of Engraving."

A series of drawings from the ancient and interesting Cathedral of Monreale, in Sicily, is now on view in the south court of the South Kensington Museum.

THE SANCTUARY OF S. WALBURGE, PRESTON.

THE church of S. Walburge, Preston, Lancashire, was, as originally designed, a parallelogram, with an open timber roof in one span of 55ft., and we give this week an illustration of the sanctuary and apse now in course of construction. The apse itself is 25ft. wide in the clear, the total length of the sanctuary being 50ft., affording ample space for the ritual arrangements. The area beneath the raised part of the sanctuary forms a crypt, approached by staircases (shown in the view) on either side at the entrances to the side chapels. The three windows originally in the flat end wall are rebuilt in the sides of the apse, and are filled with very rich stained glass; and in the side walls, concealed from view by the projecting shafts of the arch, there are arrangements of double tracery and deeply recessed windows filled with clear glass to give light to the altar, which stands considerably forward from the end wall, the space behind being occupied by a tribune, on which, approached by a staircase, is placed the throne for solemn exposition. The exterior has bold buttresses, projecting 6ft., and carried up to a height of about 70ft., with pinnacles and deeply-recessed arches to carry the parapet. The ridge of the roof ranges with the ridge of the nave roof, and is surmounted by a bronze gilt cross with the monogram "I H S" some 80ft. above the ground line. The general contractor is Mr. Baines, of Preston; the sub-contractor for the masons' work, Mr. Yates; the carver, Mr. Harding; and the clerk of the works Mr. Fitzpatrick. The design and execution of such an addition to an existing work, the walls being 63ft. high from floor of crypt to the wall plate, and the chancel arch 50ft. above nave floor, required the greatest care, and has been successfully performed. The architect is Mr. S. J. Nicholl, of London.

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BEAUFORT'S TOWER, S. CROSS, WINCHESTER.

THIS example of Early Perpendicular (A.D. 1404—1447) has in it many lessons for the student. The composition is vigorous and good. The buttress on face of tower is a singularly pleasing feature, leading the eye to the octagonal turret. The design is English throughout; later on our Perpendicular became weak and wiry, but here we have a good example. I doubt if we have any germs so good for us to develope as those of our own country. With every veneration for Mr. Ruskin and Italy, I do not think we shall find such vigorous Gothic south of the Alps. Transplanted on to our soil and exposed to our climate, the "millinery" is too apparent, and is out of place. We must change our natures before we can change our art. It is an error to think that we have exhausted our stores at home; we have only just commenced to understand what has been left us. The accident of Mr. Ruskin's fancy for Venetian art, startled as he was by our cold climate and "vergerism," led him to investigate Italian Gothic. It would have been a happy thing for us if the same keen analytical powers had been devoted to our own nobler remains. We have too little study of the spirit of our early architecture, and too much slavish copyism. We want, if we can, to engraft the spirit of our best periods on our more extended and different wants, thus, if possible, to produce an architecture characteristic of the country and the epoch in which we live. To reproduce the forms and peculiarities of a foreign art is not worthy of us. What should we say to the painter who introduced into a composition an exact copy of a figure he saw in a picture at Florence? Yet architects do this same thing, and wonder why they don't rank higher in the estimation of the public. Architecture is painting in permanent pigments, hanging its productions continually to the public gaze beyond the possibility of being "skied." It appeals to the eye and the intellect, yet often in vain, simply because it is hardly ever worth looking at, or duly invested with individuality and interest. Nobody expects to derive pleasure from it, and it is classed as a mysterious art, that has no message to give and no tale to tell. Indifference will never develope a living art—the demand must be genuine for the response to be full.

W. H. L.

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The grand new organ built by Mr. F. Booth, of Wakefield, at a cost of nearly £1,000, for the Lightcliffe Congregational Church, near Halifax, was opened last Sunday week.

The (Roman) Catholic Chapel of S. Mary the Mount, Walsall, has been reopened after restoration and alteration of the sanctuary, from designs by Mr. H. Naden, architect, of Birmingham. Messrs. Rowley & Lynex, of Walsall, were the contractors.

THE LATE GEORGE HEMMING MASON, ESQ., A.R.A.

THIS artist died at his residence, 7, Theresa-terrace, Hammersmith, on Tuesday morning, the 22nd ult., from disease of the heart, from which he had long been a sufferer. He was the eldest son of the late George Mason, Esq., of Wetby, North Staffordshire. He was educated as a surgeon, but having always had a passion for painting, he left surgery, and became an artist. He studied for some years at Birmingham, and after travelling through France, Germany, Switzerland, and Italy, he established himself in Rome, and lived there for the best part of twenty years. Although well known as an artist to the English visitors of Rome, his works were not generally known in England until he exhibited at the Royal Academy his picture of a peasant family moving their goods in a cart through the Roman marshes, called "Nelle Maremme." This picture was exhibited in the International Exhibition in 1862. In 1856 he settled in England, and began to paint English subjects. The exquisite composition of his pictures and their harmonious colour rapidly attracted the attention of artists, and he was made an Associate of the Royal Academy. The public were equally gratified by the way in which the commonest out-door incidents of peasant life, while absolutely true to nature, were invested with a poetic charm quite unique in the British school. He exhibited many small works at the Royal Academy, all infused with the same poetic inspiration. "Catch," a boy watering horses at a pool on a rough stony common, while a little girl is catching an apple he has thrown her; "The Cast Shoe," in which a belated horseman is crossing a moor in a drenching shower; a girl driving calves to shelter from a coming storm, are, perhaps, three of his best, though it is difficult to make a selection where all are so good; but the pictures of English life that attracted most public attention were the "Evening Hymn," a troop of girls coming home from church in the twilight singing the Evening Hymn, and the picture exhibited this year in the Royal Academy, of the "Harvest Moon." The former of these received the prize at the Manchester Exhibition.

Though blessed with an extraordinary fertility of invention, his works were comparatively few, as the fastidiousness of his taste was such that if it appeared to him possible to improve his pictures, he not unfrequently, on the very eve of completion, substituted one exquisitely designed group for another, and his failing health prevented prolonged application to the easel. The fortunate possessors of his works will cherish them as gems, and his friends will have to deplore the loss of one of the most amiable and genial companions.

The following is a list of his principal works:—

Name.	*In the possession of*
"Nelle Maremme."	E. L. Benzon, Esq.
"A Girl Dancing."	
"Matlock."	
'Catch."	Lady Ashburton.
"The Cast Shoe."	Stewart Hodgson, Esq.
"Girl Driving Calves."	F. Leighton, Esq.
"Gipsies on a Moor."	Arthur Lewis, Esq.
"The Evening Hymn."	The Hon. P. Wyndham, M.P.
"The Swan,"	
'A Harvest Field."	
"Girls with Milk taking Shelter from the Rain."	— Trist, Esq.
"Watley Rocks."	
"The Harvest Moon."	T. Eustace Smith, Esq., M.P.
"A Girl Driving Geese."	— Mills, Esq.

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SILICATE PAINTS.

THE results of trials made of the silicate paint manufactured by the Silicate Paint Company, appears very satisfactory, all who have used it speaking strongly in its favour. All of our readers may not know that the basis of the paint is a remarkable deposit of almost pure silica in North Wales. The proprietors submitted it to several chemists, whose analysis demonstrated that it would be of peculiar utility as a substitute for white lead in the manufacture of paint. Results have proved the correctness of this view, and the silicate paint, while less costly than the ordinary white lead paint, has favourably impressed those who have used it. It entirely resists the effect of heat, and is especially suited for use on materials exposed to the action of the weather or salt water, especially iron, there being no galvanic action, as with lead paint. The company have also introduced a waterproofing solution, in which the silica, after application to brick, stone, plaster, &c., from the action of the atmosphere returns to its original condition—that of a flint—and absolutely defies all damp.

AMERICAN IMPROVEMENTS IN MANUFACTURING ARTIFICIAL STONE.

A PATENT has been recently issued to Harlow M. Wilcox, of Chicago, for a somewhat complicated process for the manufacture of artificial stone. From two to four parts of sand, according to the grain and quality, and one part of (preferably) "Louisville" cement, are thoroughly mixed in a dry state, and then moistened with a solution of chloride of calcium in the proportion of about one ounce of chloride of calcium to one quart of water, or so as to moisten all parts of the mixture of sand and cement without bringing water to the surface when tamping the mixture in moulds. The mass or mixture thus prepared is tamped into moulds of any desired form and dimensions, after which the moulds are removed, and the form or stone is allowed to stand until the cement is partly set, and until it can be removed without danger of breaking. The blocks are then placed in an air or steam-tight vat capable of bearing a pressure of about forty pounds to the square inch, and so constructed as to admit of the introduction of steam, gas, or hot air under pressure. In connection with the vat, a vessel of suitable material and construction is used to contain chloride of calcium, and so that steam may pass therein and therefrom, charged with the chloride of calcium, and into the vat or cylinder aforesaid. A similar vessel in which soda is placed is used for a similar purpose. Another and similar vessel in which the carbonic acid gas is generated is used, this gas being also admitted to the vat. Simultaneously, and under the same degree of pressure, as near as can be, the steam charged with chloride of calcium, the steam charged with soda, and the carbonic acid gas, are admitted to the vat, their united action, under a high temperature and pressure, producing, it is claimed, a new gaseous compound, which permeates the stone, renders insoluble all the ingredients of the cement, and adds new substances, so that the weight and solidity of the stone are increased. This stone is allowed to remain in the vat under a temperature of about 230° Fahr., and under a pressure of about twenty pounds to the square inch, under the influence of the new gaseous compound, from one to six hours, according to the dimensions of the blocks. The cooling is then allowed to proceed gradually to about 100° Fahr., when the blocks are removed, thoroughly dried, and, it is claimed, fit for use.

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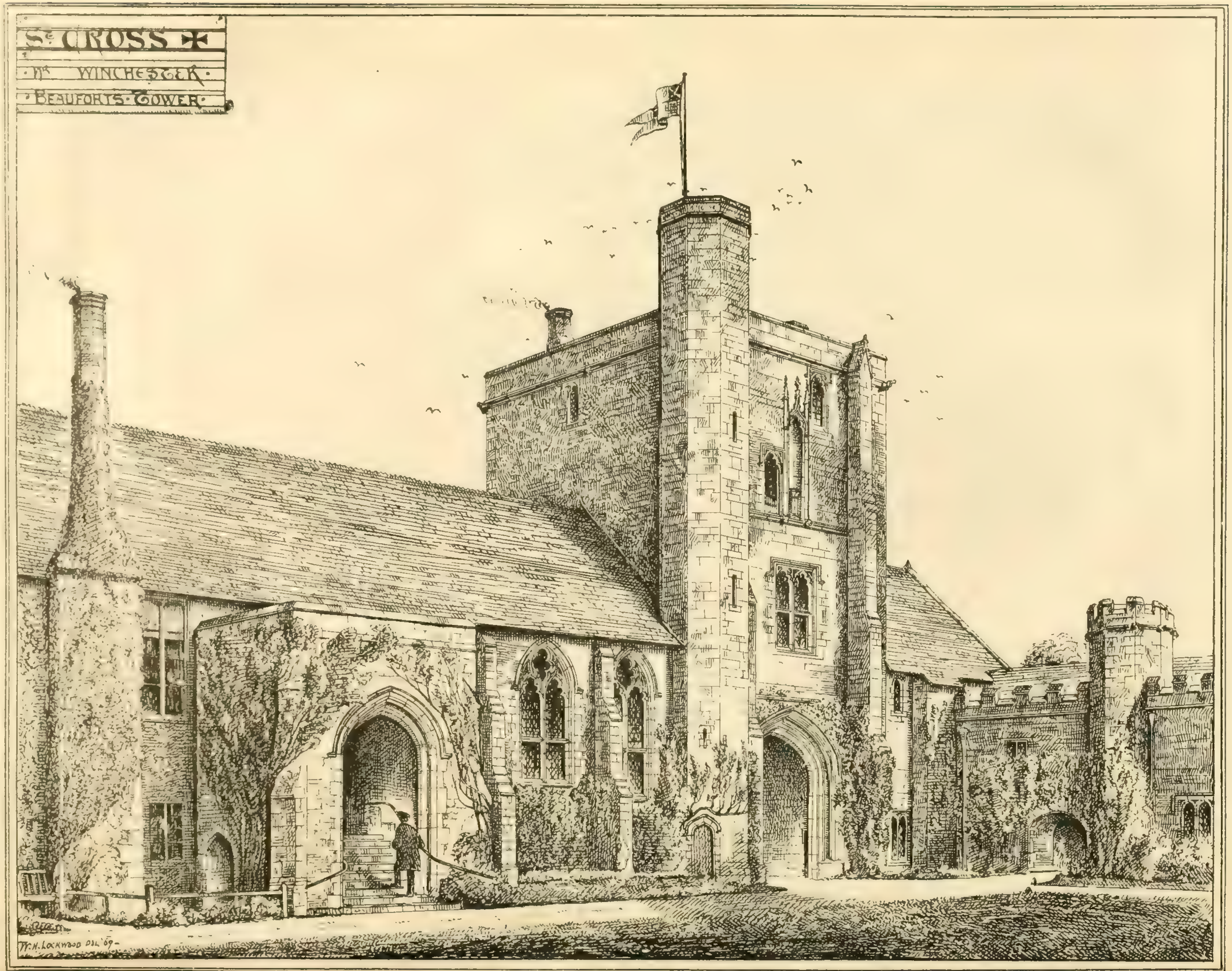
YORKSHIRE FLAGS AND LANDINGS.

OF late there has been, and still is, great difficulty in obtaining supplies of Yorkshire flags and landings, especially tooled paving, even at advanced rates. To meet this difficulty, it has been determined to form a company to lease and work the extensive range of the Scotgate Ash Quarries, at Pateley-bridge, Yorkshire. Mr. John Smith, quarry owner, of Ackworth Moor Top, Yorkshire, having been appointed to report on the nature of the stone and the capacity of the said quarries, says:—

"With respect to the stone, I knew from my previous examination that these quarries were unexcelled for producing landings of any size, a matter which, from the increased demand for this class of stone, becomes more and more important, and I find they still show the same indications of almost an unlimited supply in the whole of the face opened; put workings where you will, the sizes are such as are always in demand. Then these quarries have what few others possess—namely, all kinds of building stone produced in the millstone grit series—so that a building of any kind, from a cottage to a mansion, can be supplied entire, without going to several quarries for different kinds of stone. I see stone here similar to the well-known and much noted Elland Edge, Idle Moor, Park Spring, Ham hill, and many other kinds, all of them at the present time in great demand throughout the country. In fact, an architect or builder could hardly get wrong here for what he required in the shape of Yorkshire stone. There are here setts, kerbs, flags (or paving), &c., for street paving, wallstones, block stone, steps, landings, flags, and all other kinds required for general building purposes. And when the contemplated machinery is fixed, there is a stone suitable for sawing into slab, landings, headstones, and other things which are in great demand; and the quality is good for the aforenamed purposes. With respect to the cost of the plant and working expenses, I found, on inquiry, that they were considerably under what I estimated them at."

From all appearances, the new company commences its operations under favourable auspices. For some time past there has been a growing demand for this kind of stone, and if the report of Mr. Smith can be relied on—and we see no reason why it should not be—there is no reason why the Scotgate Ash Stone Company (Limited), if judiciously managed, should not prove an excellent investment to its shareholders.

THE BUILDING NEWS, NOV. 1st 1872.



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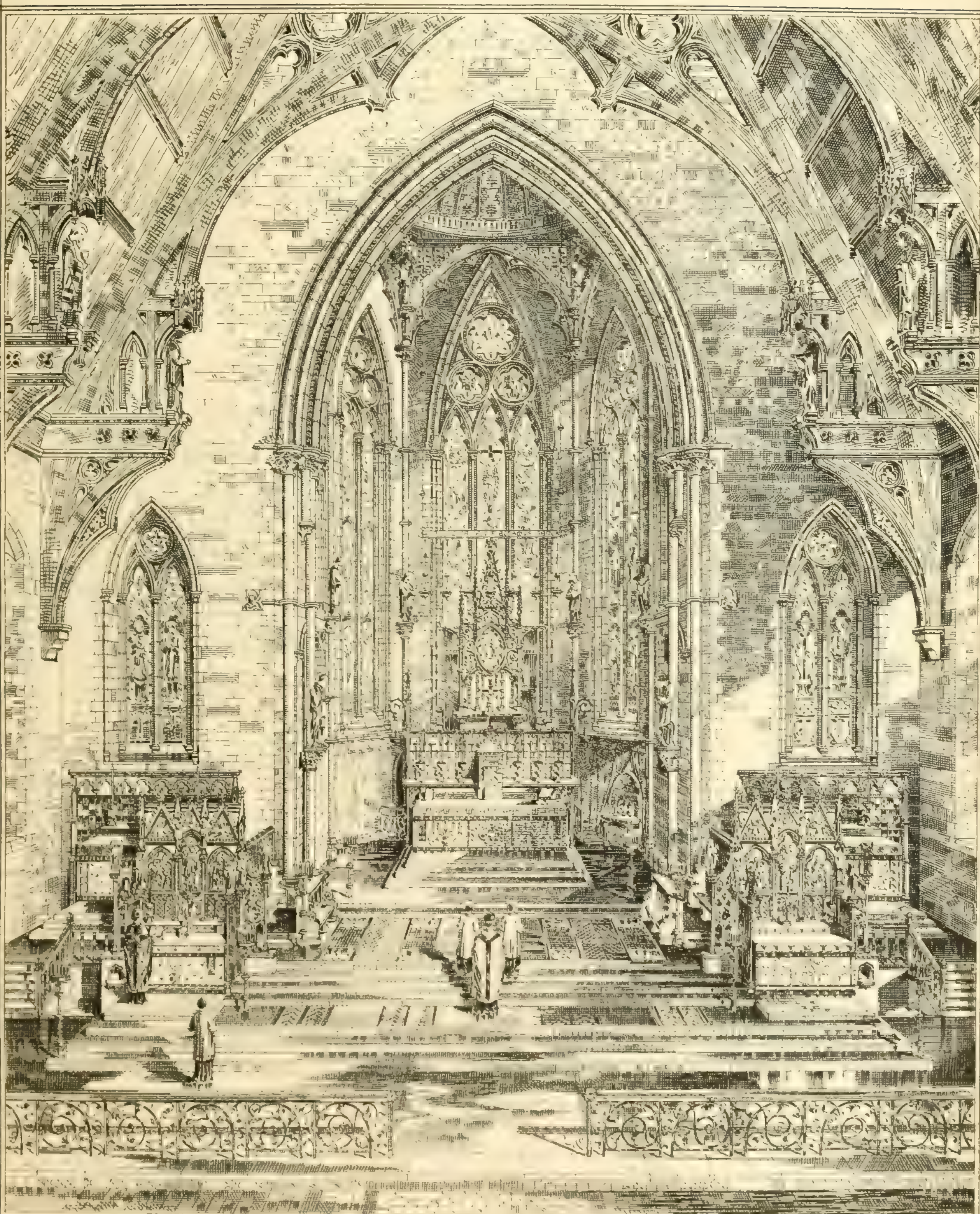

S. J. Nicholl, Architect:

The: Sanctuary: of St: Walburge's Church: Preston

FASHIONABLE ART AND ARTISTS.

HOWEVER severe the remarks, the profession must thank the Building News for the republication of the article in the *Quarterly Review* on the "Completion of S. Paul's." It at least, spite its vituperative tone towards the profession, exposes some fallacies and conventionalities of thought and discipline which have become obstructive to the path of true art progress. The theories of the writer may certainly not be new; they have been before discussed in the pages of this journal; but they come in an opportune time, and strike rather deeply into the fabric, or, if I may so term it, the "crystallisation" of "professional practice." Modern church "architecture," if it can be so designated, exemplifies this weakness of professional art more than any other branch. As at present, it is nothing but a petrifaction of conventional and antiquated forms—a thing of "shreds and patches," devoid of any just proportion or subordination of ideas. Why is this? The cause is ably explained by the reviewer. It is, in a word, too much the slave of ecclesiastical influence; and this influence, or "ecclesiasticism, has in all ages been the obstacle or the ruin of art." True Art is independent of any power, or influence, or patronage. She is, as the writer remarks, a "queen in her own right," her real sister being Science. Her sympathies are with humanity—its requirements physical and mental, and not with "creeds," formularies, or ceremonies, or any sectarian body of men or doctrine. The elements of art are those of matter and mind, universal, and belonging to man's intellect and imagination. Art may be expressive of the "religious" without being slavish. Such it was under the Greek ideal of humanity; such, during the period of Mediæval thought. It co-operated with the Church, but was never its slave, as it is now. Its conceptions were often coarse and childish, but so were the religious ideas of the age; whereas, in the present day, this coarseness and childishness is affected by art without a corresponding character in thought or religion. There is certainly a great deal of nonsensical sentiment as to the religious character of Gothic art, as if the Pointed arch or the arrangement of a Mediæval church sprang from the teaching of the Church, instead of from actual necessity, or the development of the Pagan basilica. Fashion—the fashion to make modern churches look like Middle-Age ones, and for Middle-Age Ritual to take the place of spiritual religion—has exercised a tyranny over reason and art which has deprived our church architects and artists of all freedom of idea and artistic power, and left them a set of art-phrasemongers. With such men "symbolism" is mistaken for Christian art, and mere draughtsmanship for art invention and power. As the reviewer says, such men "generally affect the Ritualist party in the church, and their weak designs and trumpery church furniture and furbelows have gained a temporary popularity among the clergy that tends to mental degradation and religious coarseness." This is strong language, but it is a truth hard to learn by some.

Having shown that sacerdotal influence does not make art, that Mediæval paintings, frescoes, and carvings, however uncouth, were genuine and artistic, simply because they were the best and most energetic productions of the Mediæval artist, and expressed his full thought and art power of portrayal with such limited knowledge and means as he possessed, let us turn to the foundation of modern professional weakness of architects and their work. This weakness will be found in the professional education and training of architects. Under the present system they become the thoughtless and slavish instruments of the "ecclesiastical," or any element which has power. As simple "phrasemongers" of art, they readily and eagerly seize any idea, sentiment, or conventional mode which becomes popular, and apply their apt form of art to it. They have set architectural idioms which suit a section or a party, either ecclesiastical or secular, but no disciplined power of art expression. I have in other papers alluded to the senseless order or process by which art is taught, and it is cheering to find, amid the confused opinions prevalent, deep thinkers and refined intellects who have thought and written on art matters advocating the only rational method of such instruction. The writer in the *Quarterly* inculcates this view when he says "A child is not taught to speak or read before it has ideas and observation;" or, a boy is not set to copy Homer before he has learned the language. And yet drawing is held necessary and precedent to making an artist. Truly, we might as well suppose the art of poetry to be learnt by penmanship as that the power and inventive genius of art can be acquired by copying old buildings, or sketching existing features. Now here we have the whole secret of the failure and want of originality and power in our modern architects and artists as "professionally" trained. Copying cannot aid or develope the inventive faculties in the slightest, but, on the contrary, must impair them. The hand and eye only are called into exercise, and only mechanically, in copying a drawing, the inventive or mental faculties being dormant; the "why" and the "wherefore," the "cause" and "effect" of things are unthought of in the process, because the combinations and abstractions are taken before the facts. It is just as absurd as teaching a child grammar before he knows the meaning of words or the qualities of things. And yet we find this the prevailing mode in art-schools, and especially in architects' offices. The student, again, who has passed his pupilage is recommended to travel, sketch, and measure, before he has acquired the rudiments of the nature or properties of the materials he has to design or work in, or their possible combinations in the mechanical structure. He is taught to copy the machine with exactitude before he is permitted to examine its parts or understand its action. If, instead of copying or drawing plans, elevations, and the like, the student were to investigate for himself and draw his own inferences by practical and tangible means—drawing being simply the means of expressing his ideas, and taught simultaneously—our young architects and artists would become *art thinkers*, and not mere mechanical "tradesmen," supplying old wares to their clients. The copying of old buildings is, perhaps, a trifle more instructive; but the practical benefit derived is little compared with the loss of time which might have been more profitably spent in the workshop or studio. But it does not end here. When, for instance, a church is to be built, draughtsmanship here takes the lead. The clerical adviser requires something that shall not be behind the ecclesiastical idea or sentiment of the day. Some church he has seen abroad—it may be in North or South Italy, or, perhaps, nearer home—is what he wants; while the "proper thing" as regards ritualistic arrangements of seats and prayer desks, even to the shape and colour of the furniture, must be adhered to. To this end some noted man, one who knows every church and has measured every detail, is employed to the task of reproducing; or some portly volumes of sketches are laid under contribution. Bit by bit the plan is put together, with due reverence to authority and ritual, and with an equal abhorrence of any lay or secular idea either in construction or decoration. When finished, such a church becomes a model of greater or less note, as its architect is popular with the clergy or otherwise. So, again, the conventional modes and favoured styles of popular "architects" become the *point de depart*, or the key-note, for the profession to follow, or, at least, the servile portion of it. Detestable slavery! misnamed "art," whose professors at the best are simply *costumiers* of fashion, and their dupes second-hand dealers of it. It is this total want of art-thought, and the too indiscriminate use of old examples, which has given the writer in the *Review* an opportunity for making such an onslaught on the profession. It has lost respect among the thoughtful and educated—even among its own ranks—and when such an invective as that of the writer is hurled against our artists and their work from the columns of a neutral journal, such as the *Quarterly Review*, there must indeed be strong grounds for misgiving the practical value of their work. It is for the profession now to prove itself worthy of confidence—to show that by a systematic training in *fact* and *thought*, instead of a dabbling in used-up ideas and a pandering to mere fashion and sentiment, it may safely be trusted with the general direction of art-work and the reorganisation of architectural design. Until it proves this it must remain a contemptible *servum pecus* of society.

Coming to the remarks on the decoration of S. Paul's, perhaps the less said the better. Mr. Burges may be an accomplished Mediæval draughtsman and decorator, possibly the most accomplished, but it is a question whether his mode and predilection are such as should warrant our national and metropolitan Cathedral being placed under his direction. It would be entering into a wide question to touch upon decoration as applied to our churches. It is questionable whether we have not gone beyond "objective" representation — whether figures of saints, martyrs, angels, and devotees are at all edifying or instructive, except to childish people; but certainly to darken the piers and walls of a church, already too dark, by coloured marbles, and to fill the windows with stained glass, would indeed be a "stupid obscuration, with no religion in it." What is needed is to lighten the interior as much as possible by cleaning, and with the addition of such light colouring as would relieve its present dulness. The windows may, to effect this object, be filled with slightly tinted and frosted glass, so as to diffuse rather than deaden the light. As to pictorial decoration in churches, it may please a weak or vulgar sentiment, but there is certainly a kind of profanation in it, besides being quite unsuited to the spirit of the age and unworthy the architecture of S. Paul's. G. H. G.

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THE FUTURE OVERLAND ROUTE TO INDIA.

THE first section of the Scutari-Ismidt Railway, which takes its departure at present from the little valley of Haidar Pasha, on the southern side of the Bosphorus, has been opened. If ever we should have an overland route to India, through Asia Minor and the Tigris or Euphrates Valley, this section of the Scutari-Ismidt line will probably be the first portion which travellers will pass over after leaving Stamboul, in Asia Minor. The terminus is about a mile distant from Scutari, and is situated at the embouchure of the little valley of Haïdar Pasha. On leaving the terminus the line makes a sharp curve towards the south, skirting along the shores of the Sea of Marmora. The ballasting and straightening are only partially done, and to all appearance there cannot have been more than one "lifting." Most of the banks have not settled yet, and after a few good rains a considerable filling up will, no doubt, be required. The culverts, too, are few in number, and their openings will certainly be found too narrow. The masonry is of a very indifferent quality, and as there is no coping a few autumn rains will melt much of the work away. The two little stations along the line are built of wood, but are quite sufficient for present requirements. Sidings, turntables, and other such accessories are yet wanting. The rolling stock, engines, and carriages are of Belgian make, and of inferior workmanship. It is expected that the whole of the line to Ismidt—about 90 miles in length—will be finished by the end of February. The contemplated extension to Kutayah and Angora—five times as long as this first section—has been only lately abandoned, after the whole of the details of the concession to M. Pressel, the Government engineer, had been settled.

THE PARISH CHURCH OF S. MARY, WILLESDEN, MIDDLESEX.

THIS church was reopened on Sunday, October 20th, after being enlarged so as to contain 287 additional sittings on the ground floor. A children's western gallery has been removed, but as the seats in it had neither backs nor bookboards, the accommodation that it provided need scarcely be taken into account. The church, as it existed previous to the enlargement, consisted of a chancel, a nave, and a south aisle, terminating in a chancel aisle at its east end and in a tower at its west end; a south porch, and a modern vestry.

In point of date, the most ancient feature is the Norman font, which had been placed behind the south chancel arch pier, next the nave arcade, consisting of three Early English arches, of two chamfered orders, resting on two circular columns of the same date. The eastern respond is modern, having taken the place of the old rood-loft stairs, and the western respond is of the Perpendicular period, having been rebuilt along with the tower, which is of that date. The chancel arch, and the arch leading into the chancel aisle, are of the same late character, as were also the windows throughout the church. These were probably reproductions of the old ones, and were introduced by the late Mr. Thomas Little, when he restored and reseated the church, and extended the nave. The recent works executed by Mr. W. Shearburn, of Dorking, consist of a north aisle, with an entrance and porch at its east end, a transept containing the children's seats and an organ loft, and a vestry, with stokery beneath it. The tower has, by the removal of the organ to the transept, been rendered available as a baptistry, thus rescuing from concealment the ancient font.

In taking down the north wall of the nave, the bases of three columns were found *in situ*, and stones of the shafts and capitals mixed up with what proved to be modern masonry and brickwork. These columns correspond exactly in detail with the Early English arcade opposite. The four arches borne by these three columns would have ranged with the three arches and the tower arch on the south side. The extension of the nave alluded to above has necessitated an arcade of five arches, opening into the new north aisle, but, after making allowance for this, it is very satisfactory to feel that the recent works produce rather a restoration than an alteration of the old church. A sufficient number of sound stones was found to rebuild one column as a memorial of the original fabric, but beyond this, care has been taken to make the detail of the new work quite distinct from the old. The other discoveries in the north wall included two heads of narrow Norman windows, the capital of a Norman nook-shaft, the remains of doors and windows of the Decorated and Perpendicular periods, and a piscina with a very narrow shelf above it. This has been rebuilt in the south chancel wall, and sedilia have been formed in the adjoining window sill. A reredos, with open tracery, through which the east window is seen, and a sacrarium pavement of tiles and mosaic, have been recently given, and the whole has been carried out from the designs, and under the superintendence, of Mr. Edward J. Tarver, architect.

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MR. THOMAS ADOLPHUS TROLLOPE AND HIS ART COLLECTION IN FLORENCE.

THE Florence correspondent of the *Times* says: There are few men better known in this city than Mr. Thomas Adolphus Trollope ,who has now for 30 years resided here, and here has written some of the best sketches and illustrations of Italian life which have ever been placed before the English public. During all those years he has also been a collector of works of art, and a large proportion of the English visitors to Florence have been admitted to view his collection, either where it formerly was, at his house in the Piazza dell' Indipendenza, or at the beautiful villa, on the rebuilding and fitting up of which he has expended several years and much money. The Villa Trollope is one of the sights of Florence; and the collection it contains, and which in ten days will be brought to the hammer, is in the highest degree interesting. Mr. Trollope has had great opportunities, and he fortunately possessed the artistic taste and archæological knowledge which enabled him fully to profit by them. The collection is very extensive, and the sale, which begins at noon on the 6th of November, will not be over until the 4th of December. Its first portion consists of 738 lots of the most varied description; pictures, old furniture (a great deal of it either in beautifully carved wood or richly inlaid), old armour, majolica, and old china of various kinds, Sèvres and Saxony, Japan and Capodimonte, marbles, tapestry, Venetian glass, Limoges enamels, embroidered stuffs, and an innumerable variety of curiosities impossible to class. The collection will be on private view on the 3rd and 4th of November, and on public view the 5th of November. The public will also be admitted daily during the sale for two hours before its commencement. It will probably be the most remarkable sale of the kind which has occurred on the Continent since that of the Demidoff collection at Paris in the spring of 1870. The second part of the sale comprises 2,000 lots, and consists entirely of books, collections of engravings (some of them rare and curious), photographs, water-colour drawings, &c. The printed books are chiefly in Latin, Italian, English, and French, with a few in German and Spanish. In the two former languages there are some rare and valuable works. In the English portion of the library there are a great many very excellent and valuable works, the best editions beautifully bound. In the miscellaneous collection some of the most striking and pleasing objects are to be found among the carved wood furniture, of which there is a great deal in remarkably good preservation. There are some very choice specimens of this work, dating from the fifteenth and sixteenth centuries. A splendid dining-room sideboard in carved walnutwood, with caryatides and sculptured columns, the upper part adorned with arabesques and Cupids, and with lions for the feet, about 8ft. wide and a trifle more in height, is the most perfect and beautiful thing of the kind I remember to have seen. It came from Sienna, and is of the early part of the sixteenth century. Two small bookcases of the same material, suitable for a sitting-room, are also of rare beauty, with carved figures standing out almost completely detached from the angles; these are of the fifteenth century. But it is impossible in a letter to give even the mere names of a tithe of the beautiful things here collected. The old Venetian chandeliers are very remarkable: the finest of them belonged to the ex-Duke of Modena. Modern Murano supplies pretty things in that style, but they must not be placed beside the products of the old manufacturers, for they will not bear the comparison, although many of the other articles turned out at that island furnace are every bit as good as the old ones, and, indeed, hardly to be distinguished from them even by the most expert connoisseurs. Particular interest attaches to a set of eight carvedwood chairs (four of them with arms) dating from the seventeenth century, and of which the seats and backs are covered with old Cordova leather, stamped with large patterns in silver and gold. There is a picture in the Pitti Gallery, in which the background is a wall covered with precisely similar leather, and there is strong reason to believe that the great painter then had before his eyes the identical leather which now covers Mr. Trollope's chairs. The author of the well-known " Life of Filippo Strozzi "—probably the best work he has written—must naturally feel a strong interest in this little fact. It seems well established that Titian painted that picture in the Strozzi Palace.

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SCHOOLS OF ART.

WATT INSTITUTION AND SCHOOL OF ARTS.—The annual meeting of subscribers to the Watt Institution and School of Arts, Edinburgh, was held on Monday. The Secretary read the annual report, which stated that during the past year the number of students had been 825, being a decrease of 39 as compared with last year. While the number of students was 825, the number of tickets sold, and presented by subscribers, was 1181. Seventeen students in the junior and seven in the senior mathematical class, eighteen in the natural philosophy class, and seventeen in the chemistry class, after due examination in their respective classes, obtained "attestations of proficiency." Five students obtained the diploma of the school, which entitles them to free admission to all the science classes. The "Horner" Prize (£3 3s.), founded in 1858 by the late Leonard Horner, Esq., one of the originators of the school, was this year offered for competition, to mechanics only, in the chemistry class. Four students competed for the prize, which was gained by Mr. J. M'Kechnie, dyer. The "Bryson" Prize (£2 2s.), instituted as a memorial of the late Robert Bryson, Esq. ,one of the founders of the school, by his family, was gained in the Natural Philosophy Class by Robert Murray, draughtsman, who obtained 93 per cent. of the value of the questions. The "Newlands" Prize (£1 1s.), founded by the late James Newlands, Esq., borough engineer, Liverpool, an old student of the school, was competed for in the Natural Philosophy Class, and gained by John Glegg, stationer, who obtained 91 per cent. of the value of the questions. The "Pillans" Prize (£1 1s.), founded by the late Robert Cox, Esq, as a memorial of his friend the late Professor Pillans, at one time president of the institution, was competed for in the English Class, and awarded to Henry Cuthbertson for essay writing. Twenty students competed at the examinations instituted by the Society of Arts, London. The cost of the new building, with the charges of the architect, clerk of works, and other necessary expenditure, will exceed the funds at the disposal of the directors, while at the same time the revenue of the Institution will be diminished, from the loss of the rents (about £90 a year) which were formerly derived from the portions of the old buildings let as shops, &c. It is hoped that an increase in the number of students may, to a considerable extent, meet this loss of revenue; but the directors appeal to the public to make up the remainder, and to clear off any debt there may ultimately be found to be on the cost of the new school.

WOLVERTON.—The annual soirée in connection with the Science and Art Classes, for the distribution of the prizes to the successful candidates, was held on the 15th ult. Mr. R. King read a statement of the proceedings of the past year. He said it was gratifying to be able to state that at no time has the institute stood so well as now, either as regards its educational or financial position or in respect to its number of members. The number of members for the quarter ended June last was 207; it was now 428. A few statistics as to the educational progress may be interesting. In 1871 the total number of students under instruction in science was 54; in 1872, 64; and this year the session of 1872-3 had opened with 100. In art: 1871, 36; in 1872, 28; and at present, 35.

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THE RIVAL CARPENTERS' SOCIETIES.

THE long-standing dispute between the London and Manchester sections of the Amalgamated Society of Carpenters and Joiners, which affected the interests of some 13,000 members and funds to the amount of about £20,000, has been brought to a satisfactory termination. In May, 1871, the executive council of the society seized the books and property of the society, took them from the house of Mr. Applegarth, the then secretary, in Stamford-street, and established themselves at East Temple-chambers, Whitefriars-street. Mr. Applegarth protested, and the provincial portion of the general council, endorsing his views, elected an executive council of their own, having headquarters in Manchester. A case brought before Mr. Mansfield at Marlborough-street Police-court, to test the legality of the Manchester council's position, was dismissed, on the ground that the society, being in restraint of trade, was beyond the pale of the law. Both parties then went before Mr. Stephenson, the Registrar, who refused to register either society in the original name until compelled by a mandamus to do so. Then the London Council applied to the Court of Queen's Bench for a rule calling upon the Registrar to register the society; but the rule was refused on the ground that a Court of Equity was the proper tribunal. At length, after trying Police-court, Registrar, and Queen's Bench, the parties turned their attention to arbitration, and accordingly, at the end of September, delegates from both sections met and agreed that the whole question in dispute—viz., which section was entitled to the title and the control of the funds of the society, should be referred to arbitration. The arbitrators appointed were Mr. John Kane, secretary to the Iron Workers' Society, Darlington: Mr. D. Guile, secretary to the Iron Founders' Society, London; Mr. Robert Austin, secretary to the Engineers' Society, Manchester; Mr. W. Hicking, of the General Union of Carpenters, Nottingham; and Mr. George Odger, London. These have been sitting at the Bell, Old Bailey, for the last eight days. The business was carried on without any legal assistance. Mr. J. D. Prior, the Manchester secretary, represented his party, and Mr. W. Harry, the secretary of the London section, conducted the business on their behalf. Mr. Guile was voted to the chair, and at the outset told his brother arbitrators that their object was to adjust the points at issue between the two societies, upon terms such as they themselves, were the case their own, would feel satisfied to accept. Some dozen witnesses were examined. Those examined by Mr. Prior were cross-examined by Mr. Harry, and *vice versa*, both being working men. Affidavits were put in, read, and marked, with all the formality and certainly the decorum of a court of law. During the eight days the work was harmoniously carried on. The unanimous award of the arbitrators was that the title of Amalgamated Society of Carpenters and Joiners should be conferred upon the Manchester section, and that the locked-up funds of two branches—Hoxton and Poplar—should be equally divided between the two sections. The arbitrators passed a resolution strongly urging both parties to re-unite. It is stated to be probable that the suggestion will be acted upon. In any case, as but one body will now come before the Registrar, he will have no difficulty in registering them, which will give the Manchester Council control over all the branches in the United Kingdom.

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A new porch is being built at the north entrance of Wigston Church, Leicestershire.

Building Intelligence.

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CHURCHES AND CHAPELS.

NEWBURY.—The Congregational Chapel at Newbury has been reopened, after restoration. The building has been reseated throughout, and the defective foundations secured. The next step was totally to alter the shape and proportion of the interior of the building by throwing into it the old lobbies, erecting new ones outside the east end, and a large and deeply-recessed apse terminating in a semicircle at the west end; relaying the floor at a lower level, and reconstructing the galleries much nearer the floor, and of about half the original size. Mr. W. H. Woodman, of Reading was the architect, and Mr. J. Hopson and Mr. Salter, the contractors.

LIVERPOOL.—The foundation stone of the new church of S. Philemon, Toxteth-park, Liverpool, was laid on Wednesday. The plans have been prepared by Messrs. Culshaw & Sumners, architects, of Liverpool. The church is to consist of a nave, chancel, transept, and one side aisle, which is separated from the nave by five arches, supported by red stone columns, with carved caps and moulded bases. There will be a small gallery, which will seat about 150 persons. The church, when completed, will be capable of accommodating 800 persons. The architectural features of the church will be plain but neat Geometrical Gothic. The walls are to be built in brick, with stone dressings and window tracery. The total cost, including provision for the school-room, will be about £5,000.

S. ANDREW'S CHURCH, LAMBETH.—This church has undergone a general renovation and cleansing. The organ has been removed from the gallery at west end and placed adjoining the chancel. The woodwork has been restored and varnished, the ceilings treated in a pearl gray, and the communion tables written in gold text upon a deep blue ground. The several works have been executed by Messrs. Phillips & Son, of 10, Baker-street, Portman-square, under the direction of Mr. S. S. Teulon, architect, of Craig's-court.

WELLS CATHEDRAL.—In the *Times* of Saturday it was stated that the restoration of this cathedral was being made under the advice of Sir Gilbert Scott. Mr. B. Ferrey, F.S.A., writes:—"May I beg to state that, though Sir Gilbert Scott was taken into consultation nearly three years ago, when he entirely confirmed my reports and recommendations, the works in progress since that time, and now, are entirely under my direction and superintendence?"

WEST BROMWICH.—The church of All Saints, West Bromwich, was reopened on Tuesday. The ground plan of the new building is somewhat of an unusual type, but is very similar to that of the church which existed upon the same site previously, but pulled down during the past year. This older building was chiefly erected during the fourteenth and fifteenth centuries, and consisted of a nave and chancel, with a north aisle and north chapel at its eastern extremity. In the present church the old tower has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92ft. in length and 30ft. in breadth; the chancel is 26ft. wide and 43ft. long, the total internal length of the church being 135ft. On the south aisle of the chancel, not extending its whole length, is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14ft. in width. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch, leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building, but which in the edifice lately pulled down was almost invisible. The altar, prominently raised upon a flight of five steps, occupies the main portion of the eastern wall of the sanctuary. The reredos—of red sandstone, as is all the rest of the church—is not at present complete, but will ultimately rise to the sill of the east window. The work has been carried out by Mr. Charles Burkitt, of Wolverhampton. The architect is Mr. Somers Clarke, jun., Westminster.

BUILDINGS.

CARLISLE.—A Committee of the Carlisle Town Council has been appointed to consider a proposition for the removal of the county prison, a large building close to the Citadel station. The building itself was erected from the plans of Mr. Smirke, at a cost of about £100,000. So great has been the increase in the local and through traffic at this station of late that an enlargement is regarded as an absolute necessity, but the difficulty lay in the proximity of this important building, which will be familiar to all who have stopped at Carlisle. If it is removed, "ample room and verge enough" will be given to the railway authorities.

HANLEY.—The foundation-stone of public baths at Hanley was laid last week. The building will contain twelve private baths, a set of Turkish baths, and a swimming bath 60ft. by 29ft. The plans were prepared by Mr. Dain, architect, and Mr. Mathews is the contractor for the building, and Mr. Bickley for the engine work. The total cost is about £6,000.

HAYMARKET THEATRE.—During the recess, the Haymarket Theatre has undergone considerable alteration; the pit has been entirely reconstructed, the floor raised, and the seats placed wider apart. The proscenium is completely new; the old ugly curve which surmounted the stage is removed, and a series of pendentives substituted, which are painted in imitation of gold mosaic, and supported upon short bracketed columns of gold, and the upper cove, which before contained a large picture occupying the whole space, is now filled with an architectural arrangement, containing a painting of the recital of a Roman comedy. The decorations generally of the house are in pure Pompeiian style, and consist of a velarium stretched upon the ceiling, which arrangement is also carried out upon that of the gallery; and a profuse employment of all the rich and bold colouring upon the other parts and the box fronts (from which latter all the projecting ornaments have been removed) made use of at that period of art. The saloon, box lobbies, and general approaches, are treated in the same spirit, but in a simple manner, so as not to detract from the effect of the auditorium. The entire decorations have been executed by Messrs. Harland & Fisher, of Southampton-street, Strand, under the direction of Mr. G. Somers Clarke, of Cockspur-street.

WOLVERHAMPTON.—On Tuesday last the new post-office at Wolverhampton was opened. It has been designed by Mr. T. Williams, the architect of the new post-office buildings now erecting in the metropolis. The style is Italian, and the building has a frontage of 48ft., and an elevation of 60ft. Messrs. Parnell & Sons, of Rugby, were the builders.

SCHOOLS.

HALIFAX SCHOOL BOARD.—The competition for new board schools in Queen's-road, to accommodate 720 scholars, has recently been decided. Out of nine designs sent in, the Board gave the preference first to the design bearing the motto "Nemo," and secondly to the one marked "Eureka." The successful competitors are Horsfall, Wardle, and Patchett, architects, Halifax.

S. SAVIOUR'S NEW SCHOOLS, LEEDS. — The Bishop of Brechin has laid the corner-stone of schools that are to be built in the parish of S. Saviour, in Cross Green-lane, Leeds. It is intended to make the new schools the centre of a district divided from the present extensive one of S. Saviour, and in order to complete this project an iron church will shortly be erected. The piece of land for the intended schools has been presented by Mr. Francis Darwin. The style of the building is Gothic, from designs by Mr. D. Dodgson, architect, 18, Park-row, Leeds. The accommodation will be for 220 children, and the schools will be well heated and ventilated, and contain necessary lavatories, conveniences, &c. The total cost is estimated at about £1,150.

WALWORTH.—At a meeting of the School Board for London, on Wednesday the 23rd ult., Messrs. H. Jarvis & Son were appointed architects for a new Board School to be erected at Walworth Common.

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MR. THEED'S STATUE OF SIR ROBERT PEEL.—Mr. Theed has at length completed the colossal statue of the late Sir Robert Peel, which he was commissioned to execute for Huddersfield. It is executed in the finest white marble, and represents the deceased statesman in his official robes as Chancellor of the Exchequer, bearing a roll of parchment in his hands and addressing the Senate. It is intended to occupy a position in the large square adjoining the railway station at Huddersfield, where it will be placed as soon as some little difficulties respecting its site are satisfactorily adjusted. It is between nine and ten feet in height, two feet taller than the statue of Lord Derby at Liverpool, by the same artist. The statue can now for a short time be seen at Mr. Theed's studio, in Henrietta-street, Cavendish-square. Mr. Theed has also just completed in plaster the model of a bust of the late Princess Hohenlohe, the half-sister of the Queen. This has been recently executed for her Majesty, who has expressed her satisfaction at the likeness, and we understand that it is intended to be placed in the interior of the Royal Mausoleum at Frogmore.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully request that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the BUILDING NEWS School Planning Competition is extended to the 30th of November, 1872. For particulars, see BUILDING NEWS, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

RECEIVED.—J. R.—C. F. H. & Co.—L. & N.—B. T.—W. H.—W. T. & Son.—J. D. W.—P. Bros.—H. T. S.—G. H. G. C. W.—W. M. & Co.—Th. B.—C. J. P.—C. B. H.—J. McD.

W. T. B.—The "BUILDING NEWS Sketch Book" is complete. For second query, write Mr. Cowell, printer, Ipswich.

J. L.—The drawing is well enough, but it is too square. It should have been, for a single page, about half as long again as it is wide. The two illustrations, for instance, given this week are not the correct proportion.

W. L.—If you write impertinently again you will be publicly rebuked.

O. X.—We should think that you would not be incapacitated for a prize.

DUM SPIRO SPERO.—Your contribution towards the School Competition to hand. You probably are not aware that the time for sending in the drawings is extended to the 30th of November.

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Correspondence.

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ART CRITICISM.

To the Editor of the BUILDING NEWS.

SIR,—I am sure we are all obliged to the BUILDING NEWS—first, for giving us such lengthy extracts from such publications as the *Fortnightly Review* and *Quarterly Review*, and for its own comments thereon. I, like many others, have read with considerable interest what the *Quarterly* has said, and I cannot agree with you in your summary and somewhat contemptuous dismissal of the writer in your last number. Whatever you may say to the contrary, such a writer is doing much good. Possibly he may not exert any particular influence on the architectural profession, but he will on the public. Even if the writer in the *Quarterly* stood alone, he possesses sufficient power to make himself felt; but when he is more or less echoed by writers in the *Times*, the *Pall Mall*, the *Spectator*, and other influential organs of opinion, he is not so easily snuffed out as the writer in the BUILDING NEWS attempted to do last week. Besides, your criticisms were not fair; I may say they were not true. You say "Our critic proved three months ago that all living artists or architects were at least either idiots or impostors; he has now included all dead ones in the same category." You were not justified in saying so much from the two articles which have appeared in the *Quarterly*. The writer of those articles evidently admires the works and reverences the memory—when there is a memory—of the men who reared our cathedrals and performed the great art work of past ages. Your sneer at the writer, who "may at last earn some brief and contemptuous mention in the history of S. Paul's or the Law Courts, and may have the happiness of attaining the same sort of immortality that belongs to the heroes of the 'Dunciad,'" was uncalled for and unjust. In fact, such criticism is the language of passion and not of reason. The writer, to all appearance, desires to remain *incog.* I have not the remotest idea who he is, neither has any one, that I know of, mentioned his name. He cannot, therefore, be influenced by such a paltry motive as the one you have attributed to him, and, whoever he may be, can afford to smile at such powerless attacks, and I beg to ask what good can accrue from such statements? And then you say "all the '*à priori* gentlemen,' who can show anybody how to do anything, but have never been able to do anything themselves, see that their theories are in imminent danger of being upset." How does the writer know that the *Quarterly* reviewer cannot do anything himself? Of course, he does not know, but yet he presumes to dogmatise. Besides, what if he be not an architect or artist, is that a sufficient reason why he should not criticise the works of architects or artists? Must he who drives fat oxen be fat himself? Must a man, to be capable of criticising a poem or picture, be also capable, of necessity, of writing a poem or painting a picture? If so, Gibbon was incapable of passing an opinion on Roman emperors, or Macaulay on British kings; and for the same reason Ruskin is out of court as an art critic, and Tom Taylor is disqualified to say anything worth listening to on dramatic actors because he is not an actor himself. The theory is not a good one, and is, in fact, absurd. The truth is, an outsider is frequently better qualified to pronounce judgment, because he occupies a vantage ground not enjoyed by the professional man, as a spectator outside a crowd can better judge of its composition than one in the thick of the crowd itself.

I for one think that the *Quarterly* reviewer is doing much good. He is fearlessly criticising the works of our crack architects, and he is saying many things which the educated public regard as true.

An Outsider.

"JOINT-ACTION."

Sir,—The graphic description of the folly of joint-action, as set forth in the last number of the Building News, will bear carrying further than the able writer of that article deemed fit.

The floor space of the "storehouse" in the "back slum" having at length a busy appearance, the "too-confiding contractor" having supplied the missing staircase, and the gas and heating all ready for work, the thing next in importance was to obtain a good supply of those "ardent youths" who were "thirsting for instruction." About this time last year it was spread abroad that on a certain evening a meeting would be held in the "storehouse," when prizes would be distributed to those who had distinguished themselves in the past session; that some eminent members of the profession would grace the meeting with their presence, and, to make it complete, and perhaps tempting, tea and coffee, &c., would be provided. The evening in question arrived, but brought with it only a sparse gathering of young men, and some six or seven of the distinguished "older men." Throughout the speeches of the seniors great disappointment was expressed at the small number present, and each speaker entered his protest against things in general, and grumbled at the meeting in particular; thus ended the opening meeting of the session.

We now proceed to notice the more immediate work of the session. A circular is placed in the hands of those who wish to know the bill of fare; it commences very grandly with a "patron," and is followed by a string of names forming a committee, and concludes as usual with an "hon. sec." We learn further on that there is a figure class, meeting thrice a week, with an instructor and an hon. sec., and a fee of 7s. 6d. per month. There is also an ornament class, meeting on the same evenings, with a fee of 2s. 6d. per month, an hon. sec., and a list of eight visitors, nearly all of whom hail from the "society of elder men."

It is to the ornament class in particular which we invite the reader to accompany us. It is Thursday evening; the sunlight is burning, and on the first gallery level are one or two gas-burners alight; a few young men pass in at the entrance, sign their names in the book kept for that purpose, and ascend the stairs; a halt is made at the first gallery; after a little search they find their drawing-boards in some obscure corner, and then seek a chair, or a "donkey" if one can be found. Salutations exchanged, the general theme for discussion is, "What visitor comes to-night?" An uncertain response from the hon. sec. leaves the question still open. "Mr. F.R.I.B.A. ought to be here," says one; another says, "I hope it is Mr. F.S.A.;" but the hon. sec., peering through his barnacles, suggests that it is doubtful whether any visitor will turn up. The discussion, however, terminates by the appearance of Mr. X. He takes each student in turn, examines his work, comments thereon, and makes a few dashes with the charcoal or chalk. A conversation ensues between the students generally and Mr. X. about the way in which the class is conducted. One complains that Mr. F.R.I.B.A. upset his work, and said he ought to block it out very carefully first, imagining the parts he could not see, and filling in the detail afterwards; having done this Mr. F.S.A. comes down and tells him he should half close his eyes and put in all the shadows first; the following week Mr. Y. inquires if his drawing has been up the chimney; and so each visitor in turn gave his own peculiar way of drawing, and the result was he was puzzled to know what to do, and so gave up the cast in question and tried another. Other students follow in the same strain, and Mr. X. thinks the best way to get over the difficulty is to hear what each visitor has to say and then choose the most preferable method.

This solution, however, is not quite satisfactory, the general opinion being that a good master always in attendance would be better. All concur that it is very kind of the "elders" to come down gratuitously, but that *joint-action* is a failure. Towards the close of the session the students gradually diminished in number, a fact to be regretted, but hardly to be helped. The circular before referred to also informs us that lectures will be delivered at different times by certain gentlemen, who have the five well-known letters after their name. Certainly this part of the bill of fare must have been for show, as only one such lecture came off, and on that occasion all had to stand on their pins the whole time, much to their discomfort.

The "storehouse" still stands, the numerous casts remain to gladden the eyes of the intelligent porter in charge, the catalogue is still promised, but the place is deserted. What will be the next move? Is this fine collection of casts to be knocked down by the hammer in order to pay the amiable contractor? Or is something to be done for the ambitious students who would gladly meet there for instruction in the noble pursuit of their profession?—I am, &c.,

X. Y. Z.

THE PRESENT POSITION OF ARCHITECTS' ASSISTANTS.

Sir,—I have read with interest the able articles which have appeared from time to time in your journal on the subject of the late disputes between labour and capital in connection with the building trade, with the result, as we are all aware, of increasing the pay of the artisan. These disputes have been followed by strikes in almost all kinds of labour, whereby the value of its productions has been considerably enhanced. To the professional world this increase in the price of almost everything makes a material difference, particularly to those who come under the denomination of clerks, and some firms employing large numbers of assistants have acceded to the requests of their *employés* for a pecuniary advancement to meet the increased rate of living, notably the various banks, railway clearing-houses, railway offices, &c.; but where only a few, and in many cases a very few, as in our own profession, are employed, the probabilities of advancement are very much lessened. The architect's assistant in many cases receives a remuneration less than the artisan, with the further disadvantage of having to maintain a better appearance, in addition to which his responsibilities are greater, and having neither club nor union to assist him, he is unable to force his demands, however just they may be. His position now is not what it was six months ago, and unless something is done to improve it he must sink below his fellow men in the social scale.

Now, sir, I should like to see this matter taken up by some of your numerous correspondents, and we may, doubtless, by thus calling the employers' attention to this matter, get them to see the truth of what I have stated, and to take a rational view of it, and so study to improve the present position of

An Architect's Assistant.

ANOTHER SKETCH-BOOK.

Sir,—As your last week's correspondent, "Trefoil," courts the opinion of others respecting the formation of another "sketch-book," I venture to propose that it should not take the form so much of a sketch-book as a collection of scale drawings from actual measurement; sketches (not from photographs) to be admitted, but only so far as they may serve to explain the other drawings. Sketchy, general ideas may be picked up in plenty, and while expressing my admiration at many of the sketches published in the Building News, I think they will be found to possess a comparatively small practical value. As an architectural student, my difficulty has not been so much to design a building in the mass; it is when we come to the details that the value of light and shade, proportion, &c., become manifest, and the student finds his lack of practical knowledge.

Again, I would suggest that domestic architecture be more sought into. Why should the great majority of either sketches or drawings treat only of ecclesiastical art? Also that the smaller details of buildings should not be overlooked; a building may have a very good doorway, which may strike the mere sketcher to be its only good feature, but its mouldings, buttresses, font, woodwork, &c., if minutely examined and measured, may be found to be—if not equally meritorious—very good types and full of suggestion. I conceive that if the range of subjects were made to comprehend details of stone, brick, wood, iron, leadwork, &c., a most valuable volume, or series of volumes, would be the result.

Could not some distinct classification be devised? Say, allow a certain time for the study and preparing of Norman ornament and details, then Early English, and so on; or, again, the drawings might be classified under the heads of stone, &c., already enumerated, and one department taken up at a time. I think our thoughts would thus be concentrated, and we should be working in a systematic manner.—I am, &c.,

Malton, October 29. John Gibson, Jun.

SECURE SASH FASTENERS.

Sir,—It may be in the recollection of many of your readers that a circular was issued by Colonel Henderson, some twelve months since, on sash fasteners. The subject of his recommendation was, at the time, proved to be notoriously deficient as a means of security against thieves, as also of the unfairness of referring the public to one particular shop to buy that which other shops had also, and sold at a cheaper rate. Colonel Henderson, to soothe the outburst of popular indignation, referred the whole question of security to one of our profession, and promised to circulate the result as largely as he had the one complained of. What I want to know is where the report can be seen, and whether Colonel Henderson's circular, founded on such report, has been issued, as I know of no one who has received it. Perhaps some of your correspondents, who may be enlightened on the subject, will kindly give me some information.—I am, &c., F. A. P.

THE ROYAL AGRICULTURAL SOCIETY'S COTTAGE PLANNING COMPETITION.

Sir,—The Royal Agricultural Society offer the following premiums for a cottage planning competition, viz.:—£1 to be given for each of the ten best designs for ordinary cottages, and premiums of £5 to be given for each of the two best designs for special cottages; that each set of drawings sent in competition must consist of one ground plan, one chamber plan, and one roof plan; four elevations, each drawn to ⅛ scale; and one, or more, if required, sections, drawn to ¼ scale, together with detailed specification and estimates.

The committee of the society state that they "have availed themselves of the information arising out of former similar competition." In 1860 the Yorkshire Agricultural Society offered five prizes for a cottage planning competition, viz.:—Three prizes of £25, one of £10, and one of £5; besides £50 and £25 for farm buildings competition. In 1863 two prizes of £25 each were placed in the hands of the Council of the Society of Arts by Mr. B. Denton, to which was added the society's medal, for a cottage planning competition.

In whatever respect the committee in the present case may be influenced by precedent, they certainly don't appear to be swayed in the least with regard to the amount of premiums given on former occasions. To offer prizes of £1 for such a competition is cool enough, but it is something surprising to think that any should be found willing to compete for a sum that will very little exceed the cost of merely tracing the designs. Of course the prospect of renown might act as an inducement, understanding that at the society's annual fair, and on other occasions, models of the prize designs are to be exhibited to the "Highland Graziers"! By giving this a place in your paper you will confer a favour on A Non-Competitor.

HALL FURNITURE.

Sir,—Work considered worthy of illustration in a public journal is, I presume, thereby thrown open to public criticism, being, as it were, "good of its kind," and an example of what the rather to imitate than to avoid. This assumption will therefore, I trust, be sufficient apology for my troubling you with some ideas (possibly they are erroneous) relative to your illustrations of hall furniture last week. That the designs to a certain degree bear out the required character of massiveness is, I think, nearly all that can be said in their praise, as they seem scarcely to answer the purpose for which they are apparently intended.

Take the hat stand. There is, first, the want of a drawer, which should always be provided for brushes, &c., though possibly it was intended these should be hung on the lowest row of small hooks; if so, it is an error, as brushes so placed gather the dust, and in use rather add than remove it from the garments. These hooks, however, may be intended as a rack for sticks; they are too small for hats. The pegs on the outer standards are really the only ones available for coats, and even here they would interfere sadly with the umbrellas, &c., in their stand. The pegs next above would well answer the purpose were it not for those immediately beneath, near the slab, which, by the way, projects too far to render them comfortably reachable, though but just far enough for use as a table. The pegs above these are, of course, only intended for hats, and are too high for even these to be reached readily, while the two uppermost are far too high for use by persons of ordinary stature.

So much for its use. In its design, the principal object seems to have been to have the greatest possible amount of stopped chamfer. The decorated panels you mention, being about 2in. × 1½in. would, I should imagine, have rather a paltry and fussy effect, to say nothing of the absurdity of putting such minute works in such a position that it can only be properly seen by going down on one's hands and knees. In respect of its especial merit of not holding the dust, I can see but little difference from the hideously ugly ones in common use, neither should I consider it a very much better specimen of constructive framing. The pedestal for bust may be an improvement on those commonly seen; but even that is, I fancy, very much open to doubt. The chair is, I think, scarcely in comfortable proportion for a seat, and I fail to see the use of the remarkably ugly handle at the back; the chair being so heavy, it can scarcely be for the purpose of lifting it. By the bye, why should not hall chairs be cushioned as others? True, they are intended for occupation a few minutes only at a time, yet that is no reason those few should not be comfortable ones. The picture frame appears, perhaps, the best of the whole; but in the absence of any idea as to its size, it is hard to form an opinion.—I am, &c., R. E. P.

P.S.—While writing I should like to remark that the competing designs for the Crystal Palace prize must have been most unbearably bad for the one you illustrated last week to be the best.

MR. WAGNER'S NEW CHURCH, BRIGHTON.

Sir,—Permit me to point out that the church recently begun for the Rev. Arthur Wagner is not on the London-road, but Lewes-road. Even some of the local press, copying the one from the other, fell into the same error.

The church, which was begun on Monday, the 14th ult., is to be dedicated to S. Martin, and take the place of an interiorly barn-like structure, bearing the same name, in the immediate vicinity, at which the troops quartered in Preston Barracks attend for service. It is to be the memorial church of the late Vicar of Brighton, the Rev. Henry Michell Wagner, and the foundation stone (it is understood) is to be laid by the Bishop of Chichester on S. Martin's Day, the 11th of November.

The church in Ann-street, commenced at the beginning of the year, is but a few yards—"a stone's throw"—from the London-road. It is dedicated to S. Bartholomew.—I am, &c., Brightoniensis.

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RECENT PATENTS CONNECTED WITH THE BUILDING TRADES.

960. W. R. Lake, London, "Fireproof roofing."—A communication.—Dated 1st April, 1872.

The said roof is formed of slate, corrugated metal, and plaster. By combining the corrugated iron with the slates the inventor secures an entirely fireproof roof, to which the slates can be easily attached.

879. J. Milroy, Edinburgh, and J. W. Butler, Willesden, Middlesex, "Cofferdams." — Dated 22nd March, 1872.

This invention consists in constructing or building cofferdams of hollow columns of ordinary brick or stone, and hydraulic or other suitable cement disposed in the form of hollow column of a circular or other configuration in sectional plan. A number of these hollow columns are constructed side by side, and provision is made for making good the joints between the said columns.

1009. J. Cochran, New Barnet, Hertfordshire, "Valves."—Dated 5th April, 1872.

The invention consists in applying to the overflow pipes of water cisterns, &c., a valve, especially to prevent the escape of sewer gases. The valve is self-acting, opening as the water rises and closing more or less completely as the surplus water flows off by the overflow pipe. Apertures in the valve case then admit water above the valve, completely closing and sealing it.

1108. W. Spence, London, "Metallic coverings for roofs and walls of buildings."—A communication. —Dated 13th April, 1872.

The covering is formed by pieces of zinc, copper, thin iron plate, or lead, each pierced with a rectangular hole, and furnished with a small sheath or staple in the same axis. These pieces are fitted on to the roofs or walls by means of specially formed nails or spikes driven into the same, and arranged in lozenge form. The pieces are formed with two sloping edges, making a plain moulding, the angular junction facilitating the escape of water just above and below the parts where the pieces are clasped.

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects.—Opening meeting of the session: Address by the President, Mr. T. H. Wyatt.

Friday.—Architectural Association.—Meeting of the Class of Design. Subject: "Carriage Porch to Mansion, ¼in. scale." 8 p.m.

Intercommunication.

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QUESTIONS.

[2676.]—**Tracings.**—When benzine is used for rendering drawing-paper transparent, it evaporates so rapidly and smells so disagreeable that it is almost impracticable to make a tracing of a drawing with the slightest degree of expedition or comfort. Can any one kindly inform me of a better method to make the transparency last, say, for several hours?—Z. X.

[2677.]—**Perspective.**—If the question is not too unimportant for insertion, may I ask if any reader can recommend a work on perspective noted as much for completeness as cheapness?—E. O. B.

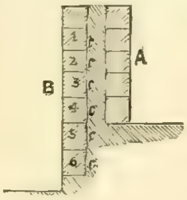
[2678.]—**Centrolinead.**—Will some reader be kind enough to inform me how to set the centrolinead?—O. X.

[2679.]—**Hoop-Iron Bond in Mortar Joint.**—I see a statement in a professional contemporary journal that hoop-iron bond built in mortar is invariably an agent of destruction. Is this really correct?—S. P.

[2680.]—**Measuring and Valuing Furnace Chimney Shafts.**—I see that several persons have asked, without result, for some more or less recognised rule for this work. I also should be extremely obliged for information.—S. P.

[2681.]—**Buff or Yellow Bricks.**—Are there any good facing bricks of a warm yellow or buff tint made in Suffolk, Cambridgeshire, Bedfordshire, or Herts? and if so, where? They must be a good sound square brick, adapted for facing internal walls. London stocks are too rough, Malm stocks are too expensive, and the ordinary white bricks have not sufficient warmth of colour.—C.

[2682.]—**Damp and Sea Salt in Party Wall.**—As sea salt and water are continuously made use of by me against a wall which separates my property from that of my neighbour, the porous sandstone of which said wall is built absorbs the salt and dampness, and allows them to pass through and cover the opposite surface B with damp and a white efflorescence, I propose to defray the cost of these damages at my own expense, and replace new stones on the side B. I should like to know, however, whether any remedy can be applied to prevent the recurrence of said damages, as I intend to continue, after placing new stones, to make use of salt and water as heretofore in this locality. Is there not any preparation—cement, or any other thing—which can be applied to advantage to the new stones internally at C which would prevent the absorption of salt and water, or some coating or lining of any kind on the surface A in my property which would answer my purpose? Any suggestions will greatly oblige. 1 to 6 indicate the courses damaged.—E. L. G.



[2683.]—**Carrying off Hot Air from Rooms.**—Will any of your readers kindly tell me the best mode of carrying off the hot air arising from a gaselier in an ordinary sitting-room without taking a pipe into the smoke flue?—C. R.

REPLIES.

[2656.]—**Puzzolana.**—The ingredients employed in preparing artificial puzzolana consist of 1 part of slaked lime reduced into a paste and of 4 parts of good clay equally reduced to the same consistency. These pastes are afterwards mixed together, worked up by a mortar mill to the consistency of brick paste, and made up into cakes of such dimensions as to contain 500 in a cubic yard. These cakes, after having been left to dry, either in the sun or under cover in well-ventilated places, should be kept at a continuous and red heat for 30 or 40 hours, after which the top of the kiln is covered with earth and left to cool. The cakes are then taken away, ground into dust, and passed through a sieve, producing the artificial puzzolana.—Galizia.

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The Exhibition of 1872 and Mr. H. Cole C.B.—Died, on the 19th ult., of sheer inanition, at 5 p.m., officially, the International Exhibition of 1872. It is long (says a correspondent) since everybody knew that Mr. Cole's last venture (numbers of us would rejoice were it indeed his *last*) would be a failure. If we are to have these big things every year something must be done to make them pay. South Kensington, with all its errors of omission and commission, and its alleged jobbery and nepotism, has done so much for art that I for one should be sorry to see it experience a similar failure; but there ought to be a limit to Mr. Cole's passion for gigantic hobbies. It is devoutly to be wished that the history of the International Exhibition of 1872 will undergo a thorough overhauling when a certain vote in supply comes before the "Committee of the whole House" of "her Majesty's faithful Commons." As for the closing of the Exhibition—the ceremony—it was neither more nor less than an enormous yearn of relief. Everybody seemed glad that the hour had arrived for putting up the shutters.

LEGAL INTELLIGENCE.

Wyatt v. Colls.—In this case (heard before Sir Thomas Chambers, Q.C., in the Lord Mayor's Court), the plaintiff, a stone and slate mason, of East-road City-road, sued for the cost of preparing and fixing slate stall plates for defendant, a builder, at Messrs. Moses & Sons', Aldgate. £12 was the charge for this work, and there were further charges for alterations and repairs made, as was alleged, in consequence of the plates being so near the ground as to be splashed in passing, and also by their being too small, owing to defendant furnishing patterns of a wrong size. Defendant denied furnishing the patterns, and said the work was disapproved of by the architect. The parties arranged, after a long hearing, that plaintiff should have £10, and the slates be divided.

Hinton v. Little.—The plaintiff in this action (tried in the Lord Mayor's Court, before Sir Thomas Chambers, Q.C.) was a builder and dealer in building materials, residing at Turnham-green, and the defendant was also a builder, and he bought the materials of the Poultry Chapel in July last. The plaintiff was introduced to defendant by Mr. Bird, the architect of the new chapel, for the purpose of purchasing these materials. Plaintiff agreed to give £40 for the materials, and resold them at a considerable profit. Plaintiff agreed to remove the materials, consisting of the pews, pillars, &c., and by request of defendant arranged to have vans at the chapel on the Monday morning following the bargain, but defendant becoming dissatisfied, countermanded the order, and then took the affair into his own hands. It was too late to countermand the order for the vans, and it was for the cost of bringing them, and the loss of profit by breaking off the contract, that this action was brought. The jury awarded plaintiff £30.

A Legal Authority* on General Line of Buildings.—The Metropolis Local Management Act (25 and 26 Vict., c. 102) enacts (section 75) that no building, structure, or erection shall, without the consent in writing of the Metropolitan Board of Works, be erected beyond the general line of buildings in any street, place, or row of houses in which the same is situate, in case the distance of such line of buildings from the highway does not exceed 50ft., or within 50ft. of the highway when the distance of the line of buildings therefrom amounts to or exceeds 50ft., notwithstanding there being gardens or vacant spaces between the line of buildings and the highway, such general line of buildings to be decided by the superintending architect to the Metropolitan Board of Works for the time being. And the section goes on to provide that in case any building, structure, or erection be erected, or be begun to be erected or raised without such consent, or contrary to the terms and conditions on which the same may have been granted, it shall be lawful for the vestry or board to cause to be made complaint thereof before a justice, who shall thereupon issue a summons, requiring the owner or occupier of the premises, or the builder or person engaged in any such work contrary to the enactment, to appear and answer such complaint; and if the complaint shall be proved, such justice shall make an order for demolition. In the corresponding clause of the former Metropolis Local Management Act (18 and 19 Vict., c. 120) the word used was the "regular," not the "general," line of buildings; and the various vestries and local boards had power by their officers to pull down and demolish buildings erected so as to project beyond the regular line of buildings. This power was restricted by the Act now in force, which renders it necessary for the vestry or board to obtain the superintending architect's certificate, and a magistrate's order, for the purpose of removing the offending structure. It was held in a case under the former Act that "regular" line did not mean absolutely straight line or regular curve, but such line as would preserve a general uniformity of appearance: Tear *v.* Freebody, 4 C. B. N. S. 228. In a recent case Willes, J., thought that the Legislature intended, in enacting the Act now in force, to adopt the decision in Tear *v.* Freebody, so that a small departure from the prescribed uniformity should not expose the unhappy owner or occupier, or builder or other person, to a penalty in a matter where there was no nuisance complained of, but merely an eyesore. It may now be regarded as settled, after some conflict among the authorities, that in any proceeding before a magistrate for the demolition of a building alleged to project beyond the general line of frontage, the certificate of the superintending architect is not absolutely conclusive, as was thought in Bauman *v.* Vestry of S. Pancras, 15 W. R. 904, L. R. 2 Q. B. 528, but the magistrate is entitled to judge for himself whether the line prescribed by such certificate be in fact the general line of buildings in such street or not: Simpson *v.* Smith, 19 W. R. 355, L. R. 6 C. P. 87. The certificate, however, may be given at any time: Wandsworth Local Board *v.* Hall, 17 W. R. 256, L. R. 4 C. P. 85, even after the summons is taken out: Brutton *v.* Vestry of S. George, Hanover-square, 20 W. R. 81, L. R. 13 Eq. 339. It looks very like a hardship that a person who erects a building in such a position that it is in danger of being considered by competent authority beyond the general line of buildings, should be obliged to pull it down by a decision founded on a certificate given subsequently to the completion of the building: yet the hardship is tolerated according to Willes, J., in Wandsworth Local Board *v.* Hall (sup.), to prevent the eyesores and inconveniences that would follow if persons were allowed to build without any reference to the other houses in the street. It is, however, the duty of the vestry or board to take steps to obtain the certificate of the superintending architect, and to take out the summons, as soon as it is obvious by the progress of the building that what they regard as an offence is about to be committed. The six months limited by section 107 for the commencement of any proceedings for penalties under the Act begin to run from the time when it is clear that there will be an intrusion on the prohibited space, and not from the completion of the building: Brutton *v.* Vestry of S. George, Hanover-square (sup.). A summons for building beyond the general line of buildings in a street is only good against the builder if it is issued whilst the building complained of is in course of erection. After the completion of the building, the summons shall be directed to the owner or occupier: Brutton *v.* Vestry of S. George, Hanover-Square (sup.) It is of the highest importance that persons affected by the exercise of stringent powers, such as those conferred on public bodies by the 75th section of this Act, should have proper notice of what is about to be done in their case: Cooper *v.* Wandsworth Local Board, 11 W. R. 646. Yet this result would not be attained if the vestry or board were at liberty to summon the builder instead of the owner or occupier any time within six months after the completion of the contract. Where a building is found to project beyond the ordinary line of frontage the only remedy is the summary one pointed out by the Act—namely, to obtain an order from a magistrate for the purpose of removing the offending structure. An indictment against the owner for having caused the building to be constructed so as to project beyond the line is not sustainable: Queen *v.* Lovibond, 19 W. R. 753, for the offence was not antecedently unlawful, and the statute points out the remedy to be pursued: R. *v.* Robinson, 2 Burr. 799. The recent decision of the Lords Justices in Lord Auckland *v.* Westminster District Board of Works, 20 W. R. 845, that the 75th section applies only to land which is about to be built on for the first time, or to land formerly built on, if there be evidence that the former owner has abandoned his right to build, seems of great importance. Not that there can be much doubt on the construction of the Act, but it is always desirable, where public bodies are entrusted with very great powers, to have a few express decisions as to the extent of the application of such powers. The 75th section merely says that "No building, structure, or erection shall, without the consent in writing of the Metropolitan Board of Works, be erected," &c., and is so far ambiguous; but it is to be read with reference to the preceding section, which is as follows:—"In case any building . . . which shall in any part thereof project beyond the general line of the street in which the same may be situate, or beyond the front of the building, wall, or railing on either side thereof shall, at any time, be taken down to an extent exceeding one-half of such building, or shall be destroyed by fire or other casualty, or demolished, pulled down, or removed from any other cause to the extent aforesaid, it shall be lawful for the Metropolitan Board of Works to require the same to be set back to such a line and in such a manner for the improvement of any street as the said board shall direct, provided that the said board shall make compensation to the owner of such building for any damage and expense which he may sustain and incur thereby." The case arose under circumstances of every day occurrence. A railway company purchased houses in Westminster for the purposes of their undertaking, and having pulled down the houses, and constructed the railway, they resold the site as building land. The decision was that the purchaser from the railway company had the same right of building on the site as the vendor to the company would have had, if he had himself pulled down the house with the intention of rebuilding it, and consequently that if the Metropolitan Board of Works ordered the new building to be set back to the general line of frontage, they must proceed under section 74, which involved the giving of compensation, and not under section 75. If a man pulls down his house with the intention of rebuilding it, the local authority cannot require the same when rebuilt to be set back to the general line of the street unless they pay him compensation; and their liability to do this is not, according to Lord Auckland *v.* Westminster District Board of Works, affected by the circumstance that the site of the house has changed owners pending the rebuilding.

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* The *Solicitors' Journal*.

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WATER SUPPLY AND SANITARY MATTERS.

London.—Dr. Frankland, F.R.S., reports that during October all the metropolitan water companies delivered well-filtered, clear, and transparent water into the cisterns and butts of the consumers. Major Bolton, R.E., Water Examiner to the Board of Trade, reports that the state of the Thames at Hampton, Molesey, and Sunbury, where the intake of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, and East London companies is situated, was very satisfactory during the month ending 15th ult. The river was also bright and clear at Ditton, where the Chelsea Company now alone draws its supply. Several of the water companies have new storage reservoirs in course of construction, which will to a great extent obviate the necessity of taking in water when the condition of the Thames, from floods or other causes, is unsatisfactory; till recently the West Middlesex was the only company whose storage capacity was adequate for this purpose.

The Purification of the Thames.—At a meeting of the Twickenham Local Board last week, a letter from the solicitors to the Thames Conservators was read. It intimated that the solicitors had received instructions from the Conservators to proceed against the Twickenham Board for disregarding the notice served upon them to discontinue the flow of sewage into the river. It transpired that the Board had decided on laying down drains to a certain point, with a view to the subsequent adoption of some drainage scheme; but that the sewage had not yet been diverted from the river, and that the Board had not yet decided whether to adopt a system of filtration or deodorisation for the treatment of the sewage. The Board resolved to inform the Conservators that drainage plans were being prepared, and that they were making as much progress as possible.

The Stamford Brook Sewer.—A long line of open drainage, at the extreme point of the jurisdiction of the Metropolitan Board, has, within the last few months, been replaced by a covered sewer. It commences at the Willesden Junction Station, the boundary, and receives the drainage of the villages of Willesden and Harlesden beyond that line; it then runs down to a culvert under the Hampstead Junction railway, a length of 1,126ft., where it unites with the general scheme which will have its local termination at the New Pumping Station at Grosvenor Basin, for which tenders have just been delivered. Mr. Thomas Pearson, of Kennington, was the contractor. No bricks are used, but the entire work is carried out in Portland cement concrete. 5ft. 6in. high, by 4ft. 2in. wide, are the square outside dimensions; and the egg-shaped sewer in the centre, rendered throughout with Portland cement, half an inch thick, is 4ft. high, and 2ft. 8in. wide. As compared with a common brick sewer, the saving in cost is 25 to 30 per cent. The Portland cement used in its construction was obtained from the Burham Company, of Belvedere-road, Lambeth. The parish of Acton have made an application to have a sewer constructed, as an extension from the lower end of this contract to East Acton, about 1½ mile in length; but as the land is mostly open heath, with scarcely any dwellings, the Board consider that at the moment the property is not sufficiently developed to justify the necessary outlay.

Sheffield.—The Corporation of Sheffield have entered into a contract with the Town Manure Company (Limited) for the collection and treatment of the night soil, &c., of that town for a term of twenty-one years. The Improvement Commissioners of West Bromwich have also agreed to enter into a contract with the company for the same purpose.

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Saturday Afternoons for Art-Workmen and Others.—The Council of the Royal Architectural Museum announce that a member of their body, Mr. William Brindley, has consented to deliver the following series of practical explanations of the architectural ornament casts in the Museum, with a view of increasing its usefulness and benefiting art-workmen and others interested; to commence at a quarter past three p.m. Admission free. Men are invited to go in their working clothes. Saturday, Nov. 2, Greek, Roman, Romanesque, and Byzantine. Saturday, Nov. 9, Norman, Early French, and Transitional to Early English (First Pointed). Saturday, Nov. 16, Early English and Early Decorated (Early First and Second or Middle Pointed). Saturday, Nov. 23, Decorated and Perpendicular (Second or Middle and Third Pointed). A course of twelve lectures will also be delivered by Mr. Ernst Pauer, on the Clavecin and Pianoforte; and Mr. Sedley Taylor, M.A., on the Theory of Sound, on Wednesday and Saturday afternoons during the months of November and December.

Buenos Ayres Government Certificate.—Translation:—We, the undersigned, at the request of Messrs. Jas. C. Thompson & Co., certify that the Iron Safes of Messrs. Chubb & Son, London, of which these gentlemen are agents, were exposed for several hours to the fire that took place in the offices of the National Government on the evening of the 26th instant; that in our presence they were easily opened with their respective keys, that the moneys and important documents they contained were found in perfect order, and that these safes are now in use in the National Treasury Office.—Buenos Ayres, July 31, 1867.—(Signed) J. M. Drago, Treasurer of the National Government; José Tomas Rojo, Juan M. Alvarez.—A true copy, A. M. Bell.—A large assortment of these SAFES may be inspected, and lists of prices obtained, at CHUBB & SONS, 57, S. Paul's Churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

Our Office Table.

Institution of Surveyors.—The first ordinary general meeting of the Session will be held at the rooms of the Institution, 12, Great George-street, on Monday, November 11th, 1872, when the President, Mr. Edward Norton Clifton, will open the Session with an address. The chair to be taken at 8 o'clock.

The Reputed Sword of Wallace.—Scotsmen who revere the memory of their great chieftain, and who have for the past fifty years been proudly exhibiting his sword at Dumbarton Castle, will scarcely thank Mr. Cardwell for his share of the action recently taken in the exposure of the false pretensions of the relic. It appears that some months ago the Grampian Club, through their secretary, applied to the War Minister to obtain the sword for the Wallace Monument on the Abbey Craig, near Stirling, that it might there be exhibited to visitors. A reply has been received from the War Office, stating that the late Duke of Wellington caused the sword to be examined in 1825, and that it was found to belong to the period of Edward IV., and to have been in all probability used by that monarch when he entered Chester in State in 1475. The result is that Mr. Cardwell has given instructions that the sword at Dumbarton Castle should no longer be exhibited as that of Sir William Wallace. We may not, however, laugh too loudly at the Scotsmen; they have had possession of *somebody's* sword, even if was that of an English Edward, and have not, like some of our Dorsetshire friends, whom we referred to a few weeks back, been paying reverence to the creation of a local blacksmith.

Brick v. Asphalte.—The Northampton Town Council have decided that in their new cattle market blue brick shall be substituted for asphalte in the flooring, although the additional expense in consequence will amount to £469. During the summer months their surveyor had visited a number of markets laid down with asphalte, and the result of his experience was that asphalte was liable to wear from the treading of cattle, and to be destroyed in other ways by them, and that in a short time after the market was opened it would be necessary to incur expense by repairing the asphalte, or then, at great inconvenience, substituting brick. No one was found to second an amendment that the contract as it stood should be carried out and the yard asphalted, although all the council appeared anxious to be economical, and, if possible, save the extra expense.

The Timber Trade of Puget Sound.—An enormous timber trade is being developed in Puget Sound. The shipments of fir from the ports of Washington territory reached, in 1869, 136,592,512ft., and for the six months ending July 1, 1872, these shipments were 118,856,561ft. The United States' Custom House records show that during the first six months of this year vessels have been loaded and despatched to almost every part of the globe. The building of a railway from the Columbia River has given a fresh impetus to the production of the district.

Sudden Death of Mr. Pollard.—At the meeting of the Metropolitan Board of Works on Friday last, Colonel Hogg, M.P., announced the death of Mr. Pollard, clerk to the board, on the 23rd ult. Mr. Lowman Taylor and Mr. Dalton united in expressing regret and sympathy with the widow, and, on their motion, a vote of condolence was ordered to be sent to the bereaved family. Mr. Pollard was the clerk of the board almost from its formation under Sir Benjamin Hall's Act in 1856, and was before that clerk to the old Commissioners of Sewers.

Continental Tenders.—The workmen of Austria appear to be nowhere in competition with their Bavarian brethren. The manager of an equestrian company recently received permission to erect a circus in the Prater of Vienna. He invited the local builders to send in tenders, the lowest of which was 80,000 florins, and the highest 130,000 florins. The builder, however, found even the lowest tender too high, and contracted at Munich with a firm for erecting the whole circus for the sum of 45,000 florins. All the parts were finished in Bavaria, and the building was put together by Bavarian workmen.

Roman Remains in Walbrook.—Within the last few days, in digging the foundations for some buildings in Queen Victoria-street, distinct traces of the old Wall Brook were reached. A mass of broken masonry indicates the course of the ancient stream, and a small portion of Roman pavement, of not very rich design, reveals the capabilities of the old workmen. A fine Roman well, in a good state of preservation, was also discovered.

THE BUILDING NEWS.

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LONDON, FRIDAY, NOVEMBER 8, 1872.

NORWICH CATHEDRAL.

IN continuance of our remarks upon the ancient-coloured decorations and their imitation or restoration at Salisbury Cathedral, we will make some observations upon those at Norwich Cathedral, which we have just had the opportunity of examining. The Dean in the latter city takes lively and commendable interest in the structure confided to his official care, and personally, without professional assistance, as we have been informed, conducts such works as he is enabled to carry out. At the present moment his structural investigations are principally confined to the extreme east end of the building, and have been rewarded by some remarkable discoveries, of which we shall say a few words in the course of this article; but at present we purpose confining our remarks to the polychromatic vestiges which he has uncovered from the coatings of whitewash which have for centuries concealed their existence. These are apparently of the date of the thirteenth century, and somewhat simple in treatment. They are remarkably subdued in tint and tone, and seem to have consisted of the application of earth colours only, in a medium of distemper. The pigments are dark chocolate or brown, red and yellow ochres, and gray. The red, however, seems heightened occasionally with vermilion, and the gray with blue, but in neither case approaching the crude tints of modern use; bands and borders of the usual Early Mediæval conventional character creep up the vaulting to emphasize the simple lines of the Norman groins. The wall surfaces are marked out in imitation of masonry, in some cases with very piquant rosettes on the supposed stones, with delicate branch ribs and leaflets. The cushion capitals are coloured, with yellow predominating as a ground, with small curled strokes at random over to relieve it, and the string-courses have rolls with brown ground, dashed over with spots of vermilion and blue gray in a very primitive style. The ancient work thus revealed is less ambitious than at Canterbury, S. Alban's, and elsewhere, and there are few indications of figure subjects. They consist of quite ordinary decorative details, and not of a highly refined kind. Still, they are suitable to the Early plain architecture they were intended to adorn, and are quiet and pleasing in general effect. The Jesus Chapel on the north side of the chancel has been recently partially rebuilt and restored, and this has been decorated as a memorial in the intended restoration of the original polychromy. Nevertheless, we cannot speak of the new work in the same terms as the old, although much care has been exercised in the matter. The effect is coarse and crude in comparison, in consequence of the tints being more violent. Those who undertake this work of reviving the old colouring seem to us to give too much weight to the possible result of fading by time, and assume that they must use stronger colours than they see. Above all, they use more, and we believe a different and harsher, blue. It is this blue, and pure vermilion used in contrast to it, which is the ruin of their well-meaning attempts. This Jesus Chapel might now, we believe, be saved and rendered a success by a few hours' work, in patiently going over again and subduing these two obnoxious colours. There is also a noble scroll on the soffit of the arch in front of its apse, which is put in a dark dowdy brown, which is far from pleasant. This scroll is identical in character with the splendid one which Mr. Seddon discovered in Great Yarmouth Church in the same county, and described in a short paper in the "Transactions of the Institute of Architects," a year or two ago. In that case the scroll was a decided red—we believe red ochre heightened with vermilion—and we think that it is most probable that this scroll at Norwich was, and would be preferable, in the same colour. The colorists who would imitate these old remains should be put into the same condition as those they would follow. They should have all their new-fangled paints taken from them, and be sent into the building armed only with black and white, with red and yellow ochre, with but a modicum of vermilion and blue, to be used under bitter pains and penalties if with other than the most stringent moderation. Nor should the black or white be allowed to be used pure, but the one reduced to a chocolate and the other to cream, and used mainly to mix with and modify the other colours. Then red with black will make chocolate; with yellow, orange; with a little blue, purple. Yellow will form an ingredient also in green, and stand itself for gold, and, with white, give all the buffs needed. Black, and white and blue, in no case used pure, will add the several grays required to complete the whole gamut of colouring suitable for this character of work. In the later styles a richer style of decoration obtained, and stronger blue called up metallic gold as a necessary contrast, and vermilion and powerful greens to them. For such work Norfolk, in its fine screens, will furnish good precedents; but it is not of this that we have now occasion to speak. It is true that the Cathedral encloses a rich and valuable treasure in the shape of a well-known altar piece, but this is a thing *per se*—the work of an artist who might claim exemption from rules needed to keep weaker brethren from offending, and if our Academicians would take to the same work we would gladly accord to them like liberty. It resembles the retable in Westminster Abbey, and has a similar ground of delicately-modelled plaster work in relief and gilded. In the nave one bay of the clerestory has been tinted, principally with grays. We had no opportunity of examining this with the old remains which it is supposed to follow; the result, however, seems soft and harmonious. A scaffolding is suspended from the fine groined ceiling of the nave, by means of which, we suppose, the Dean is taking the photographs of its interesting, though somewhat grotesque, set of bosses. These he is publishing at the present time, with the laudable double object of obtaining funds wherewith to prosecute these works upon which he is engaged, and of calling attention to their remarkable wealth of Scripture iconography. The opportunity seems to have been taken of renewing the colouring upon these bosses. Again, however, we are captious enough to doubt that, unless the work of decoration be carried further on to the ribs and spandrels, lest the effect may be too spotty.

We will now point to the structural works upon which we have cursorily remarked already. These seem to have unusual interest, and to be prosecuted with care. The apse of Norwich Cathedral, a circular Norman one, is somewhat unique in having been preserved as it has been to the height of the top of the first stage, though above it has been transformed in a later Gothic style. Until recently, the arcade has been filled in solid, and the pavement of the sanctuary covered up several feet of its piers. The former of these have been opened, so as to give, as they should, a vista into the ambulatory, and two fine Early English arches, which once gave access thence to a Lady Chapel, that regrettably has been destroyed, have been opened and filled with glass, so as to suggest their purpose. Within the filling of the apse arcade, which, to a certain height was, and will be, left as an enclosure to the choir, there has been found a remarkable and most precious relic in the shape of part of an episcopal stone seat raised high above the level of the sanctuary pavement, so that, as from the tribunes of the primitive churches, the Bishop could command the whole congregation above the altar. This chair was, doubtless, reached by a flight of steps, which have vanished, but a curious square opening into the aisle ambulatory behind still exists. The purpose of this, presumably, was to allow those behind the altar and Bishop's chair to see the elevation of the Host. The level of the first sanctuary has also been ascertained to have been considerably below the present one, and the apse itself to have been divided off from the chancel by a noble Norman arch carried upon coupled attached shafts, the bases of which were found, and the shafts themselves are now being rebuilt. We have little doubt that when this portion of the structure has been worked out with the careful attention which is being devoted to it, we shall possess in this apsidal termination of Norwich Cathedral a most interesting example of one of the earliest arrangements of the primitive churches of the land, founded upon precedents introduced from the type originally developed in Italy and Byzantium.

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BRIDGE ROADWAYS.—II.

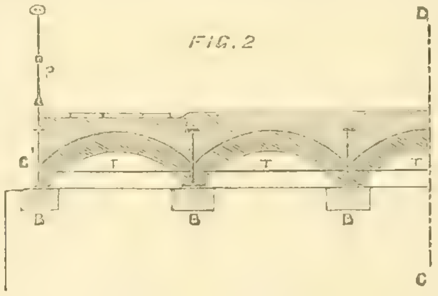
IT was explained, in our last article, that owing to the great *vis inertiæ* of arch bridges of stone and brickwork, it was a matter of no moment in what manner the load was distributed over them. From the nature of their construction, they are absolutely free from any vibration, and although no material is supposed to be theoretically void of all elasticity, yet in such substances as stone, brick, and mortar, that element is practically inappreciable. It is true that the stability of an arch, independently of the material of which it is composed, depends upon a certain adjustment of the load upon it with respect to the crown and the haunches. In large examples, this adjustment must be attended to, or the arch will fail, either by opening at the haunches or at the crown. It is to avoid the danger of unequally loading an arch, that the solid masonry or brickwork is never built up over the haunching, but is confined to the spandrel walls. The same principle of diminishing the permanent weight of the structure near the springing of the arch, is also apparent in bridges built of cast or wrought iron arches, as is evidenced by the spandrels being generally filled in with lattice or open work of some kind or other. The iron-arch bridges over the Thames furnish numerous examples of this description of construction. When once a stone or brick arch has been properly built, the centres removed, and the arch settled down to its bearings, it may be safely asserted that no load short of the crushing weight of the materials will produce any effect upon it. There may be some margin for risk when the bridge is on the skew; but so long as it is built on the square, the difficulty would be to build it so that it should fall. Unless intentionally badly proportioned and constructed, an arch bridge on the square cannot fall, and, therefore, there is no wonder that it is independent of the character of the roadway it carries upon it.

The insuperable obstacle to the general employment of arch bridges is the amount of headway they require. This evidently depends directly upon the rise of the arch, to which there is a minimum limit. Moreover, it must be kept in view that the flatter the rise of an arch, the greater the thrust, and consequently the stronger the piers and abutments must be. No sooner were railways making their way in the land, than it became clear to engineers that some other principle of bridge construction must be adopted, or it would be impossible, except at an enormous expense, to carry the lines over roads and streets. This necessity led to the partial abandonment of the arch principle, and the introduction of what may be called the horizontal system. It will be seen, as we proceed, that the substitution of cast and wrought iron girders for arches of brick and stone, caused a corresponding difference in the character of the roadways which they were called upon to support. This change was not, however, immediate, as might be supposed, owing to the fact that in the first instance cast-iron girders were generally used for carrying roads over railways. These girders were in themselves very heavy, and were not by any means so scientifically designed and proportioned as their successors in the present time. In the early days of railways, which marked the transition stage in the era of modern construction, engineers still relied a good deal upon mere weight, and mass or size was, to some extent, synonymous with strength. It is needless to remark that a more intimate acquaintance with the strength and character of constructive materials, as well as a more extended knowledge of the best forms in which to dispose those materials, have very considerably altered the original opinions of professional and scientific men on these important points.

So soon as the horizontal girder became substituted for the arch, the arrangement shown in Fig. 2 was very generally employed. That it is rather heavy and cumbersome is apparent, but it possesses the merits of simplicity and cheapness. At the present time, it is not unfrequently used for bridges with spans of 25ft. or 35ft. The system of cast-iron longitudinal girders supporting what are commonly known as "jack arches" is represented in Fig. 2. In the drawing the best form or section of cast-iron girder is shown, although many bridges were built with others of a form giving inferior strength. This was the section adopted by Tredgold, and consisted of a girder very similar to those shown in the figure, with the exception that the top and bottom flanges were equal in sectional area. The late Mr. Hodgkinson, by his valuable series of theoretical and practical experiments, completely proved that the girder, with its top and bottom flanges of equal sectional area, was not the correct form, and did not afford the maximum amount of strength with a given quantity of material. After numerous trials it was conclusively established, that the strongest form for a cast-iron flanged girder was that in which the sectional area of the bottom flange was about six times that of the top flange. It is scarcely necessary to mention that Tredgold's girder is obsolete, and Hodgkinson's universally employed by all competent professional men. The difference in the sectional area of the two flanges is produced by making the lower flange of greater breadth than the upper. The same effect could obviously be ensured by increasing the thickness instead of the width of the lower flange. The practical reason against making the thickness of one flange greater than the other, or, in fact, in making the thickness of any particular part of a casting much greater than that of another, is that it is apt to cool unequally, and bring an initial strain upon the material, which, if not guarded against, might prove a source of considerable danger.

On referring to the figure, it will be seen that the cast-iron girders are carried on bed stones, B, B, a layer of felt being placed between the top of the bed stones and the bottom flange of the girders. It may be remarked here, that the width necessary to be given to the bottom flange of the girders is very advantageous for the springings of the "jack arches." In fact, this principle of construction would be naturally suggested by the form of the lower flange of the girders. The jack arches, which should not be less than 9in. in the depth of the rings, are turned in the usual manner with plain mortar. There is no necessity for incurring the expense of turning them in cement, as is sometimes done. A layer of asphalte, shown by the thick black line, is spread uniformly over the extrados of the arches. The thickness of the layer need not exceed 1in., provided it be carefully laid on to a uniform depth. The haunching of the arches up to the level of the crown, which is on the same level as the tops of the cast-iron longitudinal girders, may be filled in with broken brick or other good dry rubbish. Over this is laid the metalling, the depth of which should be about 9in., and never less than 6in. The footpath in the figure is supposed to be flagged with stones. The thickness of these may vary from 1½in. to 2in.; but very often there is no choice in the matter, and shift must be made with the best that can be obtained in the neighbourhood. Where flags of good size can be had at a cheap rate, the haunches of the arches are sometimes not filled up; but the interval between the top flanges of the girders and the crown of the arches is crossed by flags, and the metalling laid on them. It will be observed that the outside longitudinal girder G', or "face" girder, as it is usually termed, is made only about half as strong as the intermediate ones. This is on account of its having much less weight to carry. In reality, it has nothing more to do than to support a portion of the footpath and the cast-iron parapet. The manner in which the thrust of the jack arches is provided for deserves attention. The thrust of each arch on one side of the lower part of the longitudinal girders, is counteracted by that of its fellow on the other side, and this successive action and counteraction continues until we come to the arch, one springing of which bears against the inside of the face girder. Here there is no arch on the other side to take the thrust, which is thus thrown altogether on the face girder. The girder is, no doubt, strong enough to stand the thrust without any additional assistance; but in order to relieve it of the strain, a tie rod T is carried at intervals right across the bridge, and ties all the longitudinal girders together. It acts in precisely the same manner as if there was but one arch, and it constituted the tie from the one springing to the other. These ties may be placed at about every 6ft. apart, and should be of good wrought-iron rod, not less than 1¾in. or 2in. in diameter. This roadway, carried on "jack arches," is seldom used except in connection with cast-iron longitudinal girders, as the weight renders it rather unsuitable for girders of a lighter style. There are a few rare instances in which the plan has been adopted with wrought-iron girders. An example of the cross section of a roadway of this description will be given in our next.

FIG. 2



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WATER POWER.—II.

REFERRING to what we said before about gauging the quantities of water flowing over the ground at particular spots, and comparing those quantities with the quantities due to the rainfall upon the respective drainage areas, and from that comparison estimating how much water is lost by evaporation and absorption, it does not follow that those more eminent engineers who have had the opportunities to make the greatest number of experiments in this matter of gauging are better able to judge of the character of a district, and say that this or that particular depth ought to be deducted from the register of the rain gauge, than others are—grant them the data. These data are gathered chiefly, but not wholly, from the proceedings of the Institution of Civil Engineers, when eminent men have given the facts that they have been enabled to collect. We owe it it to one of the eminent members of this Institution to acknowledge that he has summed up a great number of facts and has given us several rules to go by, but before we recall what Mr. Hawksley has said at different times it is perhaps more suitable to our view of the whole question to refer to what Mr. James Glaisher said on the occasion of the discussion of a paper on the water supply of Paisley. Speaking of the rainfall registered at Greenwich during the last 50 years, he said that there was a great difference in the fall of rain between one year and another, and even of consecutive years, and that the difference was relatively as great in all other parts of the country. In 1824 the amount registered was 36·3in., whilst in 1864 it was only 16·8in. The average fall of all the years was 25·3in., and at times, for several consecutive years, the fall was above the average, and at other times, as from 1854 to 1858, the fall for each year was below the average. No reservoir that had been made could balance the rainfall for more than three years, so that the falls of rain in consecutive wet years could not be impounded under any circumstances. Evidently, therefore, the quantity to be dealt with must be less than the average. The safest principle appeared to be to treat with the amount of water fallen in three consecutive years yielding the least. This amount was found to be nearly the average of all the years reduced by one-sixth. Thus at Greenwich the sum of the falls of rain in the three years ending 1857, viz., 61·4in., being smaller than in any other three years in the period, and 20·5in. being the average of those years, the average of the whole period, viz., 25·3in., reduced by one-sixth, is 21·1in., differing from the observed average depth of the three dry years by 0·6in. only. On the same occasion Mr. Hawksley said that formerly it was thought possible that by means of reservoirs the average of all the rainfall of a long series of years might be calculated upon for use, with the exception of what was lost by evaporation and otherwise. In the course of years it had been found, in the first place, that the allowance for evaporation had been considerably too small, and next that it was impossible to store the floods of a series of wet years, or even, frequently, of one year only. The endeavour had, therefore, been made to discover what were the real facts of the case, and what was the law by which Nature dealt with this important subject-matter. It was found, after long experience, and after laying down in curves the results of the observations over long periods—observations which had been afforded by the outlay of millions of money, in some cases successfully, but in the majority of cases more or less unsuccessfully—that in general, but not as an invariable rule, there were situations in which reservoirs could be made that would deal with the available rainfall of three consecutive minimum years. The next thing was to ascertain what was the law of the minimum, and this singular thing came out, which was true within the smallest possible fraction of all long series of rain-gauge observations extending over not less than twenty years, that if the average of (say) twenty years were taken, and from that average one-sixth were deducted, the average of three minimum dry years would be obtained, within the fraction of a single inch. That quantity might then be relied on as the probable rainfall. The amount of loss by evaporation had then to be ascertained, according to the particular district. We shall here break the thread of Mr. Hawksley's observations, and say that he speaks of the loss as nearly all, if not altogether, due to evaporation. But surely, seeing what a large quantity of water is required to support vegetation, a good deal of the loss must be due to that, however bare, comparatively with cultivated land, the moors or other land may be from which water is gathered. It has been generally said that a part of the loss is due to absorption into the ground, from which the water does not again issue within the drainage area belonging to a reservoir, and some part of the loss must certainly be due to that, but it is probable that that is a very small part, for although by the force of gravity a good deal of water must sink into the ground during the continuance of rain, yet after the rain has ceased this water is drawn up again to the surface by capillary attraction and is then evaporated.

Mr. Hawksley continued to say that the loss varied in these islands from 10in. per annum as a minimum to 18in. as a maximum. The minimum occurred very rarely; indeed, only in the case of bare precipitous mountains, consisting of non-absorbent rock, such as slate or granitic rock. From such a surface all the rain that fell could be gathered, with the exception of about 10in. But the case was very different where the surface was covered with soil and peat, and where a great part of the gathering ground may consist of flat moor land, and more so where the land is cultivated and thrown into the character of a sponge. In general, however, with mountain watersheds, where the intermediate condition exists, the actual ascertained loss amounted to from 13in. to 15in. per annum, according to the situation and some local circumstances, and might be taken at a mean of about 14in. per annum. If we remember rightly what Mr. Hawksley said on another occasion it was to the effect that he had found from gaugings of the quantity of water going over the waste weirs of reservoirs that they confirmed the propriety of this deduction of one-sixth of the depth of the average available rainfall. Now, in our case, we have said that 15in. out of 33in. must be deducted for evaporation and absorption, and that 18in. will come into the reservoir. Deducting one-sixth of 18in. we get 15in. as the available depth. A depth of 15in. over 1,000 acres would give the following quantity:—There are in 1,000 acres 43,560,000 square feet, which at 15in. deep, would yield 54,450,000 cubic feet. If we take 312 working days in a year and supply the mills with water for 12 hours a day we should be able to give out of this reservoir, year by year $\left(\frac{54,450,000}{312 \times 12} = \right)$ 14,540 cubic feet per hour, or 242 cubic feet per minute. But, as the mills are supposed to be capable of beneficially using one-third of this already, the benefit to be derived would be in respect of 160 cubic feet per minute only. Will it, then, pay to make this reservoir to give out this quantity for 12 hours a day all the year round, and year by year? Seeing what many other reservoirs have cost, and not going to either extreme, this one would probably cost £12,000, the bank being made as perfectly as possible, by raising it in thin layers with barrows and dobbin carts, the puddle being particularly well worked; the waste weir of good length, so that on the occurrence of a rare flood, when the reservoir might be nearly full, the overflow could not attain to such a height as to endanger the bank by overtopping it; a bye channel being provided for the ordinary flow of the stream, and a substantial cottage built for the reservoir keeper. The falls at these 15 mills vary from 10ft. to 30ft., the aggregate being 326ft. The wheels are all either overshot or breast wheels, of good construction, and in good working order. Then, although we estimated 13·2 cubic feet of water per second per foot of fall to be, perhaps, an average of all wheels to give an effective horse-power, we shall be warranted in taking 12 cubic feet per second in this case. This is the quantity that Mr. Fairbairn (now Sir Wm. Fairbairn) has frequently given as the proper quantity. The aggregate amount of power, therefore, to accrue to the mills from the construction of this reservoir will be $\left(\frac{160 \times 326}{12 \times 60} = \right)$ 72 horse-power. In the district we are considering an effective horse-power is worth £12 per annum, and if each mill contribute its quota according to the benefit it would receive (we will not now go into the more minute subdivision of benefits by considering that those mills nearest the reservoir would receive more benefit than those farther off) there will be an income of £864 a year. Deducting the wages of the reservoir keeper, and setting aside £40 a year to provide a fund for repairs, there would be a net income of £720 a year. The outlay being £12,000, the percentage return would be 6 per annum. But this does not represent the whole gain to the mill owners. The gain is chiefly in having a constant stream of water, and an absence of floods. Nothing is more annoying to a miller than to see water pass him which he can make no use of, and which at the same time hinders his work by backing up against the tail of his wheel. By storing the flood waters he can always reckon upon a certain power of doing work, and can enter into contracts with a certainty of being able to fulfil them. Herein lies the chief gain in constructing storage reservoirs.

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ROMANESQUE ARCHITECTURE.

[By EDWARD A. FREEMAN, in the *Fortnightly Review*.*]

THE columnar Romanesque of Italy was not the only architectural form in which the round-arched construction clothed itself. Another variety arose which was an even more legitimate development of the Roman manner of building. This was that form of Romanesque which cast aside the use of the column as a main constructive feature, and rested its arches on vast square piers. The column, where it was used at all, was used only as a purely decorative feature, as a mere nook-shaft in the angles of the rectangular piers. This mode of construction also was of Italian birth: we see it in the great Lombard churches of Milan and Pavia, and it spread itself in different forms over all the lands north of the Alps. We see it in its greatest purity in those German buildings of which I have already spoken, where the main arcades exhibit the square pier and the round arch as their one feature. And we find a great number of forms which we may call intermediate between the column and the square pier. We find rectangular piers so surrounded by attached shafts that the columnar element, though purely decorative, is that which has most share in the general effect. And we find piers of cylindrical form, sometimes of distinctly columnar form, which have little enough in common with the graceful monoliths of Ravenna and Lucca. In England, above all, we find those enormously massive round piers which by no straining of language can be called columns, but which are rather to be looked on as masses of wall analogous to the square piers, only taking a cylindrical instead of a rectangular form. And, though the construction of the square pier and that of the column are quite distinct in idea, we constantly find them mingled together in practice, not only in contemporary buildings in the same country but even actually in the same building.

Now, to the purely classical mind it is perhaps harder to admit that the Northern Romanesque is a genuine and perfect style of architecture, one to which the classical Roman was a mere transition, than it is in the case of the columnar Romanesque of Italy. There is a temptation to set aside the Romanesque buildings as not forming any really distinct style of architecture, to look on their earlier forms as the mere expiring traces of Roman art, and to look on their later forms as the mere foreshadowing of the coming Gothic. There is a temptation to do this even in Italy, and north of the Alps the temptation naturally becomes still stronger. In the earlier examples of the Northern Romanesque the work, it cannot be denied, is often of extreme rudeness. And even in the later and more finished forms of the style, such as our own enriched Norman, stately and noble as is the general effect, the mere detail, when it attempts anything coming strictly under the head of sculpture, is apt to be much less beautiful than grotesque. But the question is not as to the merit of detail, but as to the consistency of the constructive and decorative systems. The Norman Romanesque, no less than the Southern, carries out boldly, honestly, and consistently, that round-arched construction which the Classical Roman timidly strives to mask. It might be an untoward accident that ages which stood very high in the art of strictly architectural design stood very low in the art of merely decorative sculpture. But this does not affect the general principle. The Romanesque style, Northern as well as Southern, the style of Normandy and England no less than the style of Italy, succeeds in carrying out that principle of construction which the classical Roman failed to carry out. I hold, then, that the works of the early Cæsars are to be looked upon as simply transitional between the pure style of the entablature and the pure style of the round arch; they are simply imperfect attempts at a mode of building of which one type was carried to its highest perfection at Pisa, and another type was carried to its highest perfection at Durham.

Romanesque architecture, then, is neither a mere corrupt Roman nor yet a mere imperfect Gothic. It is a genuine independent style; it is the highest development of the construction of the round arch, just as Grecian is the highest development of the construction of the entablature, and Gothic the highest development of the construction of the pointed arch. As an architectural conception, it stands on equal terms alongside of the other two. In historic interest, to one who fully grasps the history of civilised man as one long unbroken drama, I do not hesitate to say that the buildings of the Romanesque ages surpass the buildings either of purely Classical or of later Mediæval times. No buildings of earlier or of later times bear about them the same charm as those which arose at the bidding of Diocletian, of Theodoric, of Justinian, of Charles, and of William. The one city of Ravenna, standing like an isthmus between two worlds, rich in the tombs and temples of the last Italian Emperors and the first Teutonic Kings, might alone supply matter for the study and meditation of a life.

Of both forms of Romanesque, the columnar type and that which employs the massive square or round pier, Italy is alike the parent. But as one type reached its highest perfection in Italy and the other out of Italy, the one by the banks of the Arno and the other by the banks of the Wear, we may fairly speak of them severally as Southern and as Northern Romanesque. This division is purely constructional, without any reference to the dates of particular buildings. As works of art, Spálato and Torcello, eight hundred years apart, must be placed closer together than either of them stands to the great mass of buildings which came between them. But we must also cast a glance at the history of the Romanesque style as looked at from a more strictly chronological point of view. A long study of the subject in various parts of Europe, in the course of several journeys, some of which were undertaken for the special purpose of studying Romanesque architecture, has, I trust, enabled me pretty well to trace out the history of the style. In that history, as far as Western Europe is concerned, I can discern two main periods of very unequal length. The former drags out its being from the third century to the eleventh, without its being possible to draw any broad line at any intermediate point. The latter takes in the busy time from the middle of the eleventh century to the middle of the twelfth, one of the richest times of architectural development in the whole range of the history of the art. The main distinction between the two is that, during the former period, Italy set the fashion to the whole of Western Europe, while, during the latter period, most of the great countries of Europe, Italy among the others, struck out independent forms of Romanesque art for themselves. The buildings of the former class are comparatively rare, but they are scattered over all the lands from the Orkneys to the Pyrenees and the Alps, and they everywhere bear the most striking likeness to one another, and the most undoubted signs of being imitated from common Italian models. The buildings of the latter class are to be found in abundance everywhere, and they strike the inquirer by their remarkable diversity, a diversity shown not so much in their detail, which is often strikingly alike in countries far apart from one another, as in the general character of their architectural conceptions. The former class, till somebody helps me to a better name, I shall speak of in a body as Primitive Romanesque. The different varieties of the latter class are best called after the countries in which they severally arose or were brought to perfection, Norman, Aquitanian, German, Italian, or any other. In England the two classes are commonly known as "Saxon," or "Anglo-Saxon," and "Norman." The latter name is a thoroughly good one, if only people will not speak of "Norman," "Early English," "Decorated," and "Perpendicular," or of any other familiar set of names, as four or seven styles or periods on a level with one another. The later Romanesque of England was undoubtedly of Norman invention, and it was brought into England under Norman influence. But the use of the word "Saxon" to express our few and scattered examples of the earlier form of Romanesque is liable to all the objections which always apply to the vague use of that misleading name, and also to some further objections special to itself. Besides the absurdity of talking of Saxon buildings or Saxon anything at York or Lincoln, the name further suggests the idea that the Saxon style was something peculiarly English, whereas our surviving Saxon buildings are simply rude examples of a style common to England with the rest of Western Christendom. The first Christian buildings which were reared in Britain after the English Conquest were said to be built after the Roman fashion,* and after the Roman fashion they went on being built till the Normanising Edward brought over a new style of building from his beloved Normandy.†

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* On the 4th of October last we gave an extract from this luminous article. We now give another, and express a hope that all interested will get and read the article itself.

Buildings of the Primitive Romanesque style are, as I have already said, rare throughout Europe. In England especially we have no surviving buildings of any great size earlier than the introduction of the Norman form of Romanesque in the eleventh century. We have nothing left but a few small and rude fragments, and a very remarkable class of towers, which enables us easily to identify the early Romanesque of England with the contemporary work of other lands. Still, we have evidence enough to show that both the square pier and the column were used in England, though the few columns that remain, as at Repton, and as responds in a good many chancel and belfry arches, are certainly of wonderful rudeness.‡ But though they often affect a good deal of barbaric richness, we find in them no sign of the distinctive features of the Norman style, while many of them do show an uncouth imitation of Roman work. But while in England we have to patch up our case from very small, rude, and mutilated examples, we find scattered here and there over the continent a considerable number of examples of greater size, belonging to various dates up to the middle of the eleventh century. Various buildings showing more or less of the features marking our so-called Saxon style, the pilaster-strips, the baluster-columns, the mid-wall shafts, and the other characteristics of the style, will be found scattered here and there over various parts of Germany, France, Aquitaine, and Burgundy. The general mass of the German examples I put by for the present, as the architecture of Germany has a distinct history of its own. But one German example must be mentioned here as standing at the head of its class. The great gateway of the Abbey of Lorsch—the Lauresheim of the days of Charles and Eginhard—remains almost alone as a work of the days, seemingly of the earliest days, of the great King himself. Of the Lorsch Gateway the lower story, with its Corinthian half-columns not yet flattened into pilasters, might almost be called Roman rather than Romanesque; but the upper stage, with its flat pilasters, its unclassical capitals, its straight-sided arches, shows that we have reached a class of buildings of which Deerhurst and Earls Barton are members. But Lorsch stands by itself; among ordinary specimens of the Primitive style, the first place is certainly due to a building in quite another region of the Empire, to the church of Romainmoutier in the present canton of Vaud. Here we have a minster of considerable size, with two clearly marked Primitive dates, belonging, if I rightly remember, to the eighth and ninth centuries, and with a little later Romanesque work to contrast with them. The piers of the original building are rude enough, very massive, but with an evident attempt at the columnar form. It is curious to compare them with the later and not very distant church of Grandson, where we feel almost carried back to Lucca in its thoroughly basilican arcades, where Roman columns have been used up again, and fitted with elaborate capitals, seemingly of the twelfth century. Two other churches of Burgundian Switzerland, on a much smaller scale than Romainmoutier, S. Sulpice in Vaud and S. Peter in Wallis, are also useful as supplying the contrast between earlier and later Romanesque. The *Basse Œuvre*, at Beauvais, that is the nave of the cathedral of the tenth century, the Temple of S. John at Poitiers, the church of Saint Aventin in the Pyrenees, in the modern department of Haute-Garonne, the crypt under the apse of the Abbey of Pleinpied in Berri, some parts of the abbey of Brantôme in Perigord all supply studies of Primitive Romanesque, in different varieties and of different dates. And at the end of our list, putting to shame even Romainmoutier at the beginning, comes the original and still perfect shell, but slightly masked by a recasting of the twelfth century, of the "micele mynster æt Rémys," the mighty Abbey of Saint Remigius, the church hallowed by the Roman Pontiff in the presence alike of the Cæsar of the mainland and of ambassadors from the *Basileus* of the island Empire.* The church where a son of Ælfgar was buried, and on whose massive pillars Gyrth looked while they were still in their freshness, has advanced many degrees beyond the work of Benedict Biscop at Jarrow and Monkswearmouth, but it still belongs to the same great class; it shows no sign of the distinctive features of the later local styles; it still belongs to the days when a common form of art, such as it was, prevailed throughout the West.

But it is the towers which give us the best evidence for the unity of the architectural style of all Western Christendom up to the eleventh century. The "Saxon" towers of England, the tall, square, hard, unbuttressed, towers, with the mid-wall shafts of their windows, their rude enrichment of square strips and long-and-short work, are familiar to every student of such matters. Sixteen years ago I was surprised and delighted to come upon a group of towers of essentially the same character in the heart of the Pyrenees, gathering round that striking minster of S. Aventin of which I have already spoken. In later journeys I came across towers of essentially the same kind in the great Burgundian Abbey of Saint Maurice† and in the great Swabian Abbey of Schaffhausen.‡ So close a likeness in such distant spots could hardly be the result of accident; it could hardly be the result of copying from one another. Earls Barton and S. Aventin were not likely to seek their models at Schaffhausen, and Schaffhausen was still less likely to seek its models either at Earls Barton or at S. Aventin. But all roads lead alike to and from Rome, and I felt convinced that the key to the likeness was to be found in all being derived from a common Italian source. The likeness among the various forms of Romanesque architecture answers to the likeness among the various dialects of the Romance speech, and is to be accounted for in the same way. As I carried my researches further, I found towers of the same type in every part of Germany which I visited, at Dortmund and at Bremen, at Coblenz and at Wurzburg. I found the banks of the Main and the Alpine pass from Innsbrück to Trent set thick with them. Once south from the Alps, there was no longer any doubt about the matter. The smaller and ruder examples of Italian towers are identical with those in our own land. There are towers at Verona and at Lincoln which might change places, without either seeming to be in a strange land. If Schaffhausen and Saint Maurice seemed like glorified forms of our own rude "Saxon" towers, the great Saint Zeno semed like a glorified form of Schaffhausen and Saint Maurice. The matter seems absolutely beyond doubt. Up to the eleventh century, no less than in the seventh, men went on building "juxta Romanorum morem." They followed Roman models, not only by some vague tradition, but by a conscious imitation of the buildings, whether of the Eternal City itself or of the hardly less renowned cities of Lombardy and Tuscany.

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FIREPROOF CONSTRUCTION.

THE following was read before a meeting of the Liverpool Polytechnic Society by Mr. L. Hornblower:—

The object of this invention is to provide walls, partitions, floors, and roofs of buildings, at once light, cheap, durable, thoroughly fireproof, and convenient for ventilating the rooms or spaces they enclose. For these purposes the following materials are employed in combination for walls, partitions, floors, and roofs; iron or steel, hollow earthenware, and concrete or cement; and for partitions, under a modification—iron or steel, metal wire, earthenware pipes, and concrete or cement.

Walls, partitions, floors, and roofs are constructed of sheet-iron or steel, preferably so formed as to represent one-half of an octagonal honeycomb cell in transverse section, reversed and placed as flitches parallel to each other, with a space of 6in. between the flitches; in this space are placed pipes of hollow earthenware, with the sides splaying outwards at the base to form a skewback. These pipes are in 2ft. lengths, and the iron flitches are bolted to and through the earthenware pipes, thus forming a composite girder. These girders are placed 2ft. from centre to centre at the proposed ceiling height, having 4½in. wall-hold at each end. A rough staying is required on which to lay the floors; between each skewback an earthernware hollow pipe, with oval-shaped head and flat soffit channelled and indented to receive the plaster of ceiling, is placed, with sufficient room left between the composite girders to receive the charge of cement concrete. This is filled in from the upper side and well consolidated. The upper surface of floor is truly levelled, and grouted with strong cement grout, and brought to a fair surface if intended solely to form floor; but if tiles, marble, flooring-boards, or parquetry are intended to be used as flooring, the concrete is simply levelled and left rough.

Holes are left in the soffits of the hollow pipes, where requisite, for ventilation, and the pipes so utilised are connected with flues in the walls adjoining, or warm air may be conveyed by the same means to any room in the house.

In walls and partitions the iron and steel lengths are placed in a vertical, in floors in a horizontal, and in roofs in an angular position.

Partitions are constructed of half-octagonal honeycomb iron or steel cells, with metal wire stretched across instead of laths to receive the cement concrete or plaster; such wire serving to tie the iron and steel lengths, and at the same time to hold and strengthen the cement concrete or plaster.

It will be obvious that bricks, flooring-boards, tiles, marble, or other desired surfaces may be attached to parts constructed in accordance with my invention, whether for floors, walls, ceilings, or roofs.

A floor can be constructed without the octagonal iron flitches, simply by forming the composite girders separately before fixing, by running a ⅝th round iron bar, with nuts and screws, through the centre of the hollow tiles, and charging the interim with cement concrete of fair quality, and when dry screwing the whole together, thus making a continuous beam and skewback to receive the hollow oval earthenware centres, which, in fact, throw the whole construction into a series of small arches bound into a homogeneous mass by the cement concrete.

This mode of construction has many advantages for cottages—it is cleanly, commands ventilation, so necessary to the health of the poor, and would not require or entail constant repairs. It is of immense importance in the construction of hospitals, barracks, dispensaries, railway stations, &c. It would be very valuable if used in the construction of floors over lock-up shops, so common in London, and in which so many fires have occurred, caused in many instances by fraudulent tradesmen who purposely set fire to their shops to rob the Insurance Companies, without any consideration for the unfortunate families that may be living above them. If used in the construction of the floors of public buildings it would be utilised admirably for warming purposes as well as those of ventilation. Another recommendation is, that it is cheap and can be constructed by any labourer of ordinary intelligence—it does not require skilled labour—simply an experienced man to superintend.

Great care must be used in thoroughly incorporating and amalgamating the materials forming the concrete together. Old bricks, broken small enough to pass through an inch mesh, well-washed gravel and sand, and furnace slag, broken as before described, made an excellent material to mix with the Portland cement. The proportion should be accurately measured—six of broken brick, of slag, and sand, to one of cement—this must be carefully turned over while dry, and well mixed. Too much water is fatal to the setting qualities of the concrete, it only washes the cement out of the mass; just sufficient water should be used to temper the mass, which should not be made in greater quantities than could be readily carried to the floors and used before it commences setting.

In forming the floors this fact must be strongly borne in mind—the material must be put in in one body; it will not do to lay the floor in layers, therefore you should not undertake more at once than you can satisfactorily complete in the day. When the floor has set for a fortnight the staging may be struck, but as the material gains strength daily until crystallisation is complete, the floors should not be too heavily taxed at first.

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* On these early churches see Bæda, Hist. Eccl. [illegible] and Vita S. Benedicti, c. 5. Benedict Biscop brought builders from Gaul to build "juxta Romanorum morem." The [illegible] of Italy, Gaul and England were the same.

† Will. Malmb. Gest. Reg. ii. 28. "In eadem ecclesia die Theophaniæ sepultus est, quam ipse illo compositionis genere primus in Anglia ædificaverat quod nunc pene cuncti [illegible] sumptuosis æmulantur expensis."

‡ [illegible], S. Benet's at Cambridge and Earl Odda's Church at Deerhurst, supply some of the best examples. The Cambridge example is, doubtless, much earlier than the other two. The use of columns in England in the seventh century is witnessed by Eddius, the biographer of Wilfrith, who speaks (Vita Wilf. 17) of his church at Ripon as [illegible] a fundamentis in terra usque ad summum ædificata, variis columnis et porticibus suffulta."

* See Norman Conquest ii. 111, 456, 2nd ed. The consecration was in 1049 at the very end of our period, when the later Romanesque was already coming in. But the work must have been begun many years before.

† The present tower was built, partly out of Roman materials, by King Rudolf, of Burgundy, in 1014.

‡ The tower and the whole church are of a piece. I feel sure that the date is 1040, but I cannot at the moment lay my hand on any authority.

The partitions would be very valuable if used instead of the stiled partitions so much in vogue now; the weight could be suspended in both from girders above, and thus relieve the floors.

For cottages and smaller houses, partitions 4½in. thick of this construction would be ample, the metal uprights being embedded in concrete.

At the commencement of this year two specimens of the flooring were erected. One specimen had a bearing of 7ft. 6in. between the supports, with 3in. wall-hold at each end, and was 14ft. wide; it was completed on January 23, and on February 10 it was loaded with 31 tons dead weight. The other specimen, with 15ft. 6in. bearing between the supports, and having 3in. wall-hold at each end, was completed on February 3, and on the 24th it was loaded with 6 tons of dead weight, on an area 1ft. 6in. wide on either side of the transverse central line, which was equal to a load of 1 ton per superficial yard.

It has been very clearly shown by the experiments of Mr. J. Grant, Mem. Inst. C.E., that Portland cement concrete does not attain its full tensile strength for years; the material gaining at the end of one year more than four times the strength it possessed shortly after construction. Consequently the bearing power of the latter sample after one year would be about 48 tons distributed over the entire surface.

Another invention, in addition to the patent flooring, is a very simple method of rendering iron columns and girders already erected in buildings perfectly fireproof, by means of a ring of fire-clay tubes, attached to the circumference of the columns and supports of the girders, securely bound together and attached to the iron by Portland cement concrete, which allows of a free current of air between the iron and external face of concrete; this casing only adds two inches to the thickness of the ring of the column.

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary general meeting of the Session was held on Monday evening last, the President, Mr. T. H. Wyatt, in the chair. The minutes of the last meeting of the past session having been read and confirmed, Mr. Richard Hardy, of Colwick, Nottingham, and Mr. Frederick Morley, of 3, Upper Merrion-street, Dublin, were unanimously elected as associates.

The President said a letter had been received from the secretary to her Majesty's Commissioners for the Vienna Exhibition of 1873, soliciting the help of the Institute in securing an efficient representation of British architecture at the exhibition, either by models or drawings. He thought the profession generally was getting a little sick of these exhibitions, and as the Council was of the same opinion, he was not prepared to lay any recommendation before the members. It was left to the members to take action in the matter if they thought fit.

Professor Kerr, in the name of the subscribers, then formally presented to the Institute the portraits (painted by Mr. Charles Martin) of Professor Donaldson and Mr. Beresford Hope, Past Presidents of the Institute.

THE PRESIDENT'S ADDRESS.

The President then proceeded to read his inaugural address, of which the following are the salient points:—Our numbers at starting last year were:—Fellows, 276; Associates, 213; Students, 21. We have now Fellows, 281; Associates, 256 (of whom three were Students); Students, 24. Amongst our Honorary and Corresponding Members we have this year elected M. Esperandieu, of Marseilles; Herr A. Guldenpfennig, of Paderborn; Il Cavaliere Enrico Alvino, of Naples; Il Cavaliere Antonio Cipolla, Government Architect, Rome; and Il Cavaliere Pietro Rosa, Rome. After deducting the losses in our numbers by death, we start this session with a gain of twenty-four in all classes. The special opportunities now available to the architectural student for education in every branch of his profession at one or other of the classes open to him are certainly not less than they were when I alluded to them last year. I wish I could report to you that they were as generally and heartily utilised as the well-wisher to his profession could desire; such, I fear it must be confessed, is hardly the case. I cannot, however, hear of any positive falling off in the numbers attending the various schools or classes. But if our enthusiasm in the study of our profession is not as great as it might be, I am sure all here will regret to learn that in Paris, where architecture used to be so popular and so successful a study, this year it is singularly unfortunate or singularly unpopular, for, at the recent distribution of the prizes at the Ecole des Beaux Arts, although there were eight first-class, seven second-class, and six third-class prizes distributed for painting, sculpture, and engraving, not a single award was made to any architectural student. I had understood that when the Royal Academy took the wise and generous step of instituting a special class for the study of architecture, and placing it under the charge of Mr. Phené Spiers, it was proposed that this gentleman should make a special report upon the system of architectural education adopted in France, and that at least the best portions of that system might be engrafted upon the one adopted at the Academy; but up to this time I have not heard of any further action in the matter. The Council of the Royal Academy having once taken the initiative in this (to our profession) interesting and important matter, will surely not let it lack their further care and energy. The Professional Examination for young architects is a subject which has long engaged the attention of the Council and a special Committee of the Institute. It is useless to conceal the fact that in spite of the time and trouble which had previously been given to the matter the scheme as at first started proved a failure. A few earnest students, indeed, availed themselves of the opportunity thus afforded of testing their knowledge and ability, and were content with the satisfaction of seeing their names enrolled in the scanty list of candidates who had won their spurs in the respective classes of Proficiency and Distinction; but it soon became evident that students required something more than this privilege to induce them to come forward for a merely nominal honour. A prejudice had previously existed against anything like a professional diploma; but, like all prejudice, having little, if any, foundation in justice, it yielded by degrees to a more generous conviction. By a resolution passed in this room the recommendation of the Examination Committee that a certificate of merit should be issued to successful candidates was approved and adopted. Since this was done the same Committee have set themselves to remodel the rules of the Examination, and to simplify their application, so as to meet the convenience of students, and to afford some more positive recognition of merit to those whose exertions in the field of technical education have been crowned with success. The Examination will henceforth be conducted in two divisions, viz., the Artistic and the Scientific Sections, and candidates will be at liberty to come up for one or both sections at a time in a given year. It is proposed that a candidate who has passed in both divisions shall have the privilege of a free studentship of the Institute for four years, and on becoming a member shall be entitled to the designation of "Graduate of the Royal Institute of British Architects."

The receipts from subscriptions, dividends, and donations in 1870 and in 1871 are strangely close. In 1870 they amounted to £1,685 11s. 1d., in 1871 to £1,687 17s. 4d., the average being £1,686 14s. The ordinary expenditure varies more considerably, but the average of the two years is £1,697 11s. 8d. —a painful proximity—one showing how much prudence is required in the appropriation of the funds, and I beg members to bear in mind what the Council truly said in their last report on this question:—"Although the financial condition of the Institute continues to be satisfactory, the Council feel that there is a limit to its resources, and that while a fair proportion of its income is devoted to the encouragement of professional study and other general objects, it would be unreasonable to expect that expenses incurred for objects of a still wider range should be borne exclusively by a private society. For instance, the cost of the General Conference last year was £132 12s. 7d."

Since this time last year the obituary of our own members contains the names of: Mr. Henry Ashton, Fellow; Mr. James Spencer Bell, Fellow; Mr. H. J. Booth, Fellow; Mr. Frederick Marrable, Fellow; Mr. Edward Charles Hakewell, Fellow; Mr. W. Powell, Associate; Mr. J. Williams, Associate; Mr. A. Bailey Denton, Associate; and within the last few days, one who was for many years a member, Mr. Thomas Allom.

Our losses in the class of Honorary and Corresponding members have been the following:—Sig. Carlo Bonucci, of Naples, ex-Director of the Excavations at Pompeii; Il Professore Besia, of Milan; Herr Joseph Kranner, of Prague and Vienna; and M. Leon Vaudoyer, of Paris.

This time last year I ventured to remind those present of the great claims which the Architectural Benevolent Institution has upon our profession, and how indifferently I thought the Institute, as well as the profession generally, responded to that responsibility. The result of that appeal or reminder has not, I fear, been as useful as I had hoped and expected; and I learn from the indefatigable secretary of that charity, that "up to the present time the Society has had little farther accession of funds, either in the shape of donations or subscriptions, traceable to the appeal I ventured to make last year."

After detailing the work of the second Conference of Architects, the President gave a short *résumé* of the progress of architecture at home and abroad, touched briefly on the questions of competitions and architectural criticism, and concluded by describing the action taken by the Institute in reference to the ruins of Baalbec and the excavations at Ephesus.

Mr. Beresford Hope, M.P.: I have much pleasure in rising to convey to you, sir, the feelings of the Institute on the very admirable and most practical address which you have just given us. Having had myself on two occasions to perform a similar duty, I know how anxious the task is, requiring much consideration as to what topics to bring before such a body as this, and how to arrange them so as to at once answer to one's own consciousness of truth, and be palatable to those who hear them. Looking back on the papers with which I troubled this Institute, I congratulate you, sir, upon the manner in which you have compressed so much into a small space, and for the skill with which you have suppressed matters upon which a little temporary *eclat* might have been gained by you had you touched upon them, but which references would not have done any real good to the profession if published to the world. The world is ill-natured enough—it is a good-natured world in many respects, but very ill-natured in others, and it is naturally suspicious; it is jealous, it is too fussy in matters of art; it goes in for "payment by results," and never considers the difficulties by which those results may be attained, and therefore it is absolutely necessary that you as architects should hold together by the common bond of respect for the dignity of the profession—respect for the honour of the profession viewed on its business side; respect for the grandeur of the mission of architecture viewed as an art. (Hear, hear.) We may do that very well, and yet have our strong conscientious convictions. We may fight out in this room, as knights *sans peur et sans reproche*, the respective merits of the pointed arch, the pediment and the round arch; these are all matters on which we must, every one of us, have our convictions, and having those convictions, it is right to stand up for them. But while we fight the "Battle of the Styles" *à outrance*, let us never let such differences of opinion hinder us in standing shoulder to shoulder against the stinginess, the vulgarity, and the suspicion which we often meet with in high places. (Applause.) Depend upon it, great buildings will live while the memory of First Commissioners will pass away like the dead leaves which market gardeners sweep away. (Laughter.) There is one point in your address, sir, which rather attaches to me. It is that of the Architectural Art Classes. You pointed out how necessary it is to keep them up, and you further pointed out—and there is no doubt that you are perfectly correct—that the three societies that are responsible for these art classes ought to put their shoulder to the wheel. Now, having had the honour to be at the head of one of these societies [the Architectural Museum], I must point out that I do wish that the Architectural Museum had always reached that dangerous approximation between receipts and expenditure which you think so discouraging in this Institute, but which in that society we should think the apex of prosperity. You must look upon the Museum as a society that has attempted a great deal, and without receiving a fair amount of support from the public, considering our enterprise, and the untiring labour especially of our friends the treasurer (Sir Gilbert Scott) and the hon. sec. (Mr. Clarke). I look upon these art classes as most important in themselves, and trust that they may not be allowed to drop.

Mr. Jennings seconded the resolution, to which, it having been carried by acclamation, the President briefly responded, and the proceedings terminated with the announcement that the next meeting will take place on Monday the 18th inst., when a paper will be read by Mr. T. Roger Smith "On Professional *Esprit de Corps*."

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Edwin E. Johnson, one of the most eminent of American engineers, died on the 12th ult. He was engineer in chief of the Northern Pacific Railroad until a little more than a year ago, and since has been consulting engineer of that company.

ARCHITECTURAL ASSOCIATION.

THE first ordinary business meeting of this Association for the present session took place on Friday evening last, the President, Mr. J. Douglass Mathews, A.R.I.B.A., in the chair. The minutes of the final meeting of last session having been read and confirmed, the following gentlemen were elected members of the Association, viz.: Messrs. A. Twyman, W. G. Doolan, H. Ward, W. H. Reynolds, A. F. Spratt, R. E. Bartlett, W. S. Jackson, A. W. Hennings, F. Wilson, W. E. Riley, G. Fish, R. Avelands, W. H. Langston, E. B. Peter, S. C. Searle, F. Hennings, H. S. Snell, jun., and W. Scorer, jun.

ANNUAL REPORT.

Mr. B. A. **PAICE** then read the annual report, of which the following is an abstract :—

At the ordinary fortnightly meetings of the past session, papers were read on the following subjects: "On William of Wykeham" (prize essay) by Mr. W. R. Mallett; "On the Three Schools, or the Distinctive Aims of Classic, Mediæval, and Modern Art," by Mr. Wyke Bayliss, F.S.A.; "On the Mediæval Architecture of North and Central Italy," by Mr. H. L. Florence; "On Hammer-beam Failures, Eltham Palace," by Mr. W. White, F.S.A.; "On London as it is and as it might be," by Mr. A. Payne; "On Domestic Stained Glass," by Mr. L. F. Day; "On the Abbey Churches of Caen," by Mr. R. P. Spiers; "On Japanese and Chinese Art," by Mr. G. A. Audsley; On Christian Iconography," by Mr. G. H. Birch; "On Architectural Writing," by Mr. T. Roger Smith; "On Reredoses," by Mr. Lacy W. Ridge; "On Modern French Architecture," by Mr. G. H. West; "On the Paris Fires," by Mr. R. W. Edis, F.S.A.; and "On School Planning," by Mr. E. R. Robson. The attendance at the meetings was generally satisfactory, and some of the discussions were of special interest. The prizes offered by and through the Association were awarded in the last session as follows: For the essay: "A Monograph of William of Wykeham," to W. R. Mallett; for the best series of designs in the Class of Design. 1st., to S. J. Newman, 2nd. to W. Penstone; for the best series of detailed drawings in the Class of Design (offered by Mr. E. Lee), to J. A. Reeve; for the best set of drawings in the Elementary Class of Design, to P. J. Marvin; for a summary of subjects treated at the Class of Construction and Practice, to R. E. Pownall; for a design for a hospital for 100 beds (offered by Sir William Tite), 1st. to K. D. Young, 2nd. to W. Scott; for measured drawings from existing buildings in England previous to the eighteenth century (offered by the Architectural Union Company), to P. J. Marvin; an additional prize (offered by the Association), to I. W. Brooke; for a design for a house in a London street (offered by Mr. E. W. Godwin, F.S.A.), 1st. to H. Avern, and 2nd. to T. E. Hudman; for the best set of studies from the Antique at the Architectural Art Classes, to H. Gaye. The *Library* has been largely increased in the past session. Donations of books have been received from the Council of the Royal Institute of British Architects, Messrs. Bruton, E. B. Ferrey, Morel et Cie, Wyatt Papworth, Perry, Phillips, Sharpe, and Stannus. The committee specially place on record their sense of obligation to Mr. Wyatt Papworth for his very handsome gift of a large number of valuable works. In order to provide for the great increase in the number of borrowers, it has been thought desirable to use a large portion of the library funds in the purchase of duplicate copies of some of the books most in demand. The librarians invite suggestions, both as to books and the best means of promoting the increased usefulness and efficiency of the library. The *Class of Design* was carried on with fair success. The *Elementary Class of Design*—established to afford the younger members opportunity for, and stimulus in, the practice of design and the critical study of old work—will be found very serviceable in the next session. By the system pursued, skill and knowledge may be obtained of a kind often quite out of the reach of junior students, and only to be acquired in any case with much difficulty in private study. Of the *Class of Construction and Practice*, somewhat similar remarks may be made. The Committee regret that this class did not meet last session with its usual success. It has, however, been arranged to carry on the work of the class upon a plan somewhat different to that formerly pursued, and it is hoped that considerable numbers will join with spirit in these studies, which must improve their working knowledge of building details, and be of service in actual practice hereafter. The class for instruction in *Surveying* and *Levelling*, was carried on as usual, under the instruction of Mr. E. Bennett. The *Water Colour Class*, under the superintendence of Mr. P. J. Naftel, of the Society of Painters in Water Colours, was continued with success. In the session now commencing it is intended to supplement the above mentioned classes (now deemed part of the regular machinery of the Association), by classes for *Experimental Chemistry* and for *Practical Geology*, the course of study in each being arranged to supply the special class of information required by students in the profession. A series of six lectures on *Professional Practice* will be delivered by Mr. T. Roger Smith during the session, open to all members of the Association. Any sufficient number of members wishing to establish other classes for the study of special subjects will receive consideration and assistance at the hands of the Committee of the Association. The Saturday afternoon *Visits* to works in progress and ancient buildings have been continued, the members being much indebted to the architects and others who have allowed them these privileges, and accompanied them on these occasions. The following were among the places visited during the session:—The City Library and Museum; S. Augustine's Church, Kilburn; the new buildings for the Learned Societies, in Piccadilly; the parish churches of Croydon and Beddington; the Church for the Deaf and Dumb, Oxford-street; and S. Alban's Abbey Church. The third annual architectural *Excursion*, under the direction of Mr. Edmund Sharpe, occupied from the 19th to the 24th August last. Stamford and its neighbourhood to the eastward, and the principal buildings of the Nene Valley as far as Northampton, were visited. The number of members taking part in the excursion, the quality of the buildings, the perfect weather, the cordial receptions, and the pleasant fellowship among students from many parts of the United Kingdom, rendered the excursion most enjoyable. The systematic explanations by Mr. Sharpe greatly aided the students in the critical comparison of the works of different periods of Mediæval art, and many complete measured drawings and general sketches were got together. The Committee feel that the thanks of the Association are due to Mr. Sharpe for his past exertions, and hope that many such pleasant and useful weeks may be spent under his direction in future years. The sixth volume of the Architectural Association *Sketch-book* has been commenced. The Committee managing the work have a valuable series of sketches in hand for publication. The *Register* of the Association continues a means of confidential communication between architects and assistants. The *Architectural Examination* was held last year, and five candidates, all members of the Association, passed the Preliminary Examination. The younger members who have passed the earliest stage may be expected to increase the number of candidates coming forward in the classes of Proficiency and Distinction in succeeding examinations. This account of what has been done in the past session will show to all who are connected with or interested in the profession the special work now undertaken by means of the Association—over and above the fulfilment of its original purpose of promoting intercourse and personal knowledge among those engaged in kindred studies and pursuits. In a society so entirely self-governed and self-sustained, and undertaking such varied tasks, individual exertion on the part of a large majority of the members is indispensable.

On the motion of Mr. Paice, seconded by Mr. Ravenscroft, the report was unanimously adopted.

The report of the Treasurer showed that the income of the Association for the past session was £133 6s. 8d., and the expenditure £116 18s. 5d., leaving a balance of cash in hand amounting to £16 8s. 3d. The liabilities are estimated at £36, and the assets £431 5s. 3d. The report was unanimously adopted.

THE PRESIDENT'S ADDRESS.

The reports of most of the various classes having been read and adopted,

The President, Mr. J. **DOUGLASS MATHEWS**, then proceeded to give an address, of which the following is the substance :—

For several years past the President had had to congratulate the members on the continual prosperity of the Association, and he had no reason to depart from this custom. As far as numbers are concerned, the past session had been satisfactory, seventy new members having joined, and although the number of resignations was great, and consequently no great increase had taken place, he was, nevertheless, disposed to think there was a growing stability in the Association. Members did not join simply for the sake of enrolling their names, but did so with the definite object of availing themselves of some of the advantages offered. This was important, as they were most desirous for all their members to take an active interest in one or other of the branches. He would ask new members to make up their minds immediately on their election to join at least one of the classes, and he would also urge upon the proposers and seconders of new members to make a point of introducing their friends to the classes, or else to get others to do so. It would be an advantage if the officers could have more personal intercourse with new members, but he feared this was not possible. On looking through their list of members it would be observed that it included many who were resident in the country. This sometimes arose from a temporary absence in London, but in many cases from a desire of countrymen to associate themselves with us. He had often felt that it would be very desirable if he could scheme something by which their country colleagues could derive substantial benefit. He confessed the subject was a difficult one, but he would throw out the suggestion as to the practicability of extending the advantages of the Library to them, and also those of the Classes of Design and Construction. He was aware this would entail considerable extra work on the officers, but he was sure this would be readily given, especially as in so doing they would be conferring an immense benefit on many who had no chance of availing themselves of the privileges they had, and who almost looked with envy on those of their fellows who were resident in the metropolis. The finances continued in a satisfactory condition, for although they have been rather liberal in their expenditure during the past session, they began with a balance in hand. With a view to the more efficient working of the Association, it had been arranged to hold monthly meetings of the Committee, at which the several sub-committees and classes would report their proceedings. It was hoped by this means that more general interest would be kept up, and that it would tend to a general unity of the whole. The syllabus of the session now commenced contained several well-known names, and the subjects were of a varied and interesting character. It would make the ordinary meetings much more valuable if the members generally would consider the subjects beforehand, and be prepared to make some remarks upon them. Much extra information might by this means be elicited, and it would greatly encourage the lecturer to find a lively interest taken in this subject. There were, of course, topics that some are much more interested in than others, and it is not fair to expect the same speakers to have something to say upon every subject. It had been suggested that the presence of

> A chiel amang ye takin' notes,
> An' faith he'll prent it,

deterred some from speaking, but he for one should be very sorry to see the Association forsaken by the Press. They had heard very good accounts of the Library: its importance could not be overstated. The advantage of being able to take a book home, instead of hastily glancing at it, as was too often the case in a reference library, was in itself a great boon. The Librarians had exercised a wise discretion in the selection of their books by purchasing those that had a direct bearing on the art and practice of architecture, and also by obtaining duplicate copies of those works most in request. He thought they might fairly congratulate themselves that after many years of striving they had now a Library of which they had no reason to be ashamed. The competition for the prizes had somewhat improved, but was still not as successful as might be desired. To those who required a stimulus for work, the prizes should form powerful incentives, and although the thought and labour necessary for competition were great, it should be borne in mind that whether successful or not, the competitor had obtained much valuable information that must be useful to him hereafter, and that he would probably not have obtained without it. The Committee have felt it desirable to discourage the system of awarding prizes given by private individuals, and although not at all wishful to refuse those which are so frequently offered, consider that it is opening the door for what, if much extended, will become a great abuse. They have, therefore, instituted a Prize Fund, to which they invite donations. The stamina of the Association may be said to be its classes, and the success of these indicates more clearly than anything else its healthy state. They have ever been the means of imparting much information, as well as cultivating friendship among the members; and it is hoped that this session will see them more successful than ever. Having dwelt on the work of the various classes, the President said he could not refrain from bearing witness to the great amount of time and thought bestowed during the past session by the late President, Mr. Rowland Plumbe, and the other officers, especially the indefatigable secretaries, Messrs. Quilter and Paice, each and all of whom deserved the best thanks of the Association. Mr. Quilter had now resigned his office, after four years of active service. The amount of time required to carry on successfully the work of the Association was immense, and the efficient way in which this is done by voluntary labourers proved that, whatever might be said to the contrary, architects had an *esprit de corps*, and sufficient love for their art to devote their time and energy towards improving themselves and fitting their younger colleagues for its practice and advancement. The example of the Association was being well followed in the provinces, and only the other day societies were inaugurated at Dublin and Belfast with objects almost identical with those of the Association.

One of the subjects considered at the recent Conference of Architects was that of Professional Charges. After obtaining a number of individual opinions, the matter was fully discussed in the meeting, and the result was a new schedule based upon and differing but little from that issued by the R.I.B.A. in 1862. Mr. Matthews believed this would be found to be all that was necessary, and although it might not comprise a charge for everything that an architect might be called upon to do, it was sufficient to guide any honourable man. To a young practitioner such a schedule was of great value, as it would often prevent a misunderstanding with a client, who sometimes thought that the younger the man the lower would be his charge. He was glad that the Surveying Clauses were not eliminated, as he considered that to juniors these branches were important stepping stones, both in practice and emolument, and in the present crowded state of the profession they could ill afford to lose any of what might be called "accessories," which, although not absolutely an architect's work, were yet best performed by him whose training or experience had made him practically acquainted with the subjects. Some fears were expressed as to the effect which the revised schedule would have upon the former one, which had been recognised as an authority in the Courts of Law. He thought such fears were groundless, as the schedule published in 1862 was drawn up and issued only by the Institute, whereas the recent one was so nearly the same in substance, and having undergone the most careful supervision and discussion by architects from all parts of the country, was adopted by the general Conference, which appeared to him to increase its authority considerably.

The subject of competitions also occupied the attention of the Conference, and was one that was of especial interest to the Association. Whatever might be the opinion of established architects, most young men would admit that the principle of competition was right, not merely as affording an opportunity of bringing men to the front who might otherwise remain behind, but also as being a great incentive to design and hard work. In a competition each one would, of course, do his best, and to this end would use all means of getting the information necessary to carry out his design. If he should not succeed in gaining the prize, the time will not have been wholly thrown away, as he will have obtained valuable information which will be serviceable to him hereafter. In approving of competitions, Mr. Mathews said he referred, of course, to those only in which the conditions were fair on part of the promoters; but they should set their faces against the absurd practice which was daily gaining ground of offering for competition buildings of a trifling character. There could be no need of half the competitions advertised; frequently the local architect was quite as capable of designing the building as a stranger, and the reason for asking for a competition was often only a cloak for underhand practices, or with a view to attempt to get a building erected under its fair cost. He feared the abuse of competition had been increased in a great measure by architects' own acts. It was not to be expected that as competition is the order of the day, the public would forego it in the case of the architect if it found him ever ready to accept any invitation to compete, and even to solicit it, and then to prepare unnecessarily elaborate drawings, utterly regardless of labour and cost. Architects should make a point of abstaining from any competition where the requirements were unreasonable, and if they establish this as a principle, the public will recognise the propriety of it, and require only those drawings which are absolutely necessary to indicate the intentions of the designer. This would be sufficiently shown in an open competition by pencil sketches, and if more were afterwards required, a selection of a certain number of competitors might be made and a second competition invited, to each of whom should be paid a sum sufficient to cover his expenses. Competition often proved a strong temptation to pupils and assistants to prepare designs in their after hours. He could not help thinking that this was a mistake. If a young man should be fortunate enough to have his design selected in one instance, he might perhaps give up his regular employment in the full expectation of a continuance of success. If he was disappointed in this, talents, which with experience and training would lead to a bright career, were oftentimes thrown away. The subjects of the employment of surveyors and the practice of making Bills of Quantities the basis of the contract, were also discussed at the Conference, but no decision was arrived at, in consequence of the difficulty of adopting any system that would be satisfactory in all cases. He considered it most desirable for every young architect to have a knowledge of the principle of taking off quantities, both as a protection to the client and as a means of enabling him to carry out his work with more confidence, as most of the details and difficulties which would cause trouble would have already presented themselves, and have been surmounted or settled, before the work is commenced. The schedule of charges admitted the principle of architects supplying their own quantities if occasion required, but on the understanding that it should be done with the concurrence of the employer. After referring to the Architectural Examination, Mr. Mathews proceeded to consider the present state of architecture in England, which he considered such as to cause little anxiety, compared with that of other countries. There was more individuality in design, and more boldness in treatment, than in most foreign architecture (except, perhaps, in America, whose architects were trying hard to overtake us), and in the late Berlin competition, although an English architect was not successful, the drawings exhibited maintained the credit which our countrymen have obtained on former occasions when competing with their continental brethren.

It had been suggested that the grand secret of an architect's failures was that he was not an artificer, as well as a designer, as was the case in the Early and Middle Ages. Whether this was so or no he would not now argue, although he did not think it would require much time to give convincing proof that in the Middle Ages, at least, the workman was not the designer of the whole building, although many of the details were doubtless left to him. But whatever was the custom then, it was perfectly certain that system could not be carried out now. The buildings were of a totally different character to those of our day, being chiefly large and monumental, whereas ours, as a rule, were of a smaller and varied description, and yet requiring as much of the architect's skill as the larger ones. But allowing that such a suggestion could be carried out, the result would be a considerable increase in the cost of the works, and the probability of less experience and knowledge being brought to bear. It was worth consideration whether a modification of this plan might not be carried out with advantage to the public, and also to the architectural profession. Although not advocating the principle of one architect supplying the design and another to carry it out, he thought the plan pursued by engineers a good one, and if adopted, each building would have its resident architect, to whom would be entrusted the general design and superintendence of the works, but under the supervision and guidance of the consulting or superior architect. This would relieve architects in large practice of much responsibility and anxiety; it would give the public confidence, by retaining the services of a first-class man, and ensure the works being carried out faithfully because constantly superintended by the designer. It would be of advantage to the younger men, in giving them a position and practice, and the experience thus gained would, in course of time, fit them to fill the post of superior architect. It was true this plan is now adopted to a certain extent, but the difference is between the resident architect and the clerk of the works; but he considered the functions of the two would be very different, and much responsibility would be thrown on the resident architect that does not belong to the clerk of the works.

Having urged the claims of the Architectural Benevolent Society on the profession, Mr. Mathews concluded his address by insisting upon the importance of young architects relying on their own individual effort in acquiring knowledge of their profession.

A brief discussion followed, and the thanks of the meeting having been given to Mr. Mathews for his address, the meeting terminated.

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Mr. Fowler, C.E., who has been engineer and surveyor to the borough of [illegible] for [illegible] years, and was previously engaged as Borough Surveyor at [illegible], has just been appointed engineer and surveyor to the borough of Salford, at a salary of £[illegible] per annum. There were [illegible] candidates for the office. Four were selected to appear before the special committee, namely:—Mr. Fowler, Mr. A. Latham, C.E., Croydon, Mr. Burkham, C.E., Battersea; and Mr. [illegible], C.E., West Derby.

PERMANENT AND TEMPORARY STRUCTURES.*

It is not surprising that in this country, where, hitherto at least, all engineering works have been of necessity carried forward by an ingenious adaptation of whatever material may have been found at hand, rather than by a careful selection of that best suited to the required purpose; where the engineer has been constantly obliged, like Franklin's chemist, to "saw with a file and file with a saw," that the mere substitution of a comparatively indestructible material like iron for wood, should popularly be supposed to constitute the difference between a "permanent" and "temporary" structure.

Under the conviction that this hasty classification may lead to dangerous results, it is proposed in the present article to briefly review the practical aspect of the question in so far as it is connected with bridge building.

Strictly speaking, of course there is no such thing as absolute permanency; but, practically, we would define a permanent structure to be capable of lasting, with few or no repairs, as long as the use for which it was designed shall exist. When we examine the precedents afforded in the works of the ancients, we see that though absolute permanency may be unattainable, an unnecessary degree of it may easily be obtained. We see in all countries where Roman arms introduced Roman civilisation, public works, as viaducts, aqueducts, and the like, standing as strong and staunch as when first reared by the hands of their indomitable builders, though the uses for which they were constructed have long since passed away. They are instances of redundant strength, produced by a lavish use of the best material, and they would have equally well fulfilled their purpose had they been so built as to have crumbled to the dust ages ago. They have, in fact, long outlived their usefulness.

On the other hand, while we have all around us examples of railway superstruction carried over streams on rapidly rotting piling, requiring constant renewal, or, at best, on unpainted and unprotected timber bridges, we have not far to go for instances of the opposite extreme.

A truly permanent structure requires not only the use of an imperishable material, but of a sufficient quantity of it. It is not enough to calculate the strain on each member of a truss, and proportion each to such strain, allowing, perhaps, a margin of five times the breaking strain to constitute a permanent structure. A structure composed of elastic materials, as wood or iron, is constantly in play, no matter what precautions may be taken to stiffen it, and is consequently constantly wearing out, exactly as a man's coat is. If a structure, such as a bridge truss, is designed to be a permanent one, this wear must be provided for. We have no hesitation in declaring that, viewed in regard to wear, there are but few iron truss bridges in the country that have any claim to the title of permanent structures. Moreover, were it not that a croaking engineer is almost as distressing a spectacle as a crowing hen, we would not hesitate to predict a frightful series of disasters, owing to the sudden failure of many trusses to meet the calls upon their resisting properties—properties which sooner or later must be "taken out" of them by the ceaseless wear upon their members. We need not remind any engineer of the peculiar vice of iron as a material for construction, namely, its treachery. An iron tie or brace, on the very eve of rupture, gives positively no evidence of weakness to the most practised eye. Any one who has seen a wire rope part like rotten tow under less than its customary load, immediately after a careful inspection, knows how such appearances are to be trusted in ironwork. We never approach the subject of the comparative quantities of different materials and modes of construction without being forcibly struck with its analogy to human physiology. A deep, light spider-like truss, each member containing the minimum of material, and the whole set up so stiff and taut with the counterbraces that it sings like a harp in the wind, is in perfect analogy with the man of high-strung nervous temperament, who, without a pound of superfluous flesh or muscle in his frame, is constantly driven on by the goading of his nervous system to the full extent of all his powers of endurance. In both cases there is no provision for wear and tear, and in both the final result is apt to be sudden collapse, when the overworked members, completely worn out, "strike work" without warning. Both are very well in their way, but neither can be counted on for continuous and trustworthy effort.

If a bridge is to be constructed with a view to safety and permanence, it must fulfil one of two conditions. Either the material of which it is composed must be such as to plainly indicate symptoms of any approaching weakness, or else its members must possess immense redundant strength to afford abundant margin for wear and tear, and mechanical and chemical change in the nature of the material. The best material for permanent work is undoubtedly brick, or some kinds of choice stone; for it is not subject to wear, owing to its non-elasticity, and, besides, would indicate by cracking any failure of resisting properties. Timber, by betraying unmistakably any approaching weakness, is a perfectly safe material; and though we hear constantly of the failure of wooden structures, it is only because the warnings which they gave of impending rupture were unheeded. Iron, on the contrary, gives no warning, and betrays no weakness by which one might be prepared for the danger which menaces. The only safety in an iron bridge, is, therefore, to proportion its parts to a strain vastly in excess of any that can possibly come upon it, and this for two reasons—first, for the actual strength, and secondly, for the additional weight, which secures a greater preponderance of the fixed over the rolling load. An iron bridge, to be secure, must possess sufficient substance to absorb the shock of the rolling strain. The universal thrill which runs through a light, taut truss, is very ominous of a brief existence.

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* From *Van Nostrand's Magazine.*

We do not in the least wish to be understood as recommending a promiscuous piling on of material, merely to increase the weight of a bridge. On the contrary, the problem of the strains should be worked out with the greatest nicety, quite as much so as if not a superfluous pound of material beyond the most strictly necessary amount were to be put in; but having thus found the position and magnitude of each strain, it should be provided for by an immense excess of material if the structure is intended to answer to the requirements of a permanent one. Moreover, the truss should in all cases be well counterbraced, not as a remedy for the shakiness of a too slight structure, but as a preventive against its appearance.

It may savour of old fogyism, but we cannot withhold the assertion that the only true form for a permanent iron bridge is the plate or tubular girder. It is undoubtedly the least economical form, as requiring the most material for a given resistance, but it is the safest and most staying; and if ever iron gives warning of impending failure, it is when in the form of rivetted plates. On the other hand, the combination which requires the least material for a given strength, namely, the Warren system, aggravates in a singular degree all the worst defects of iron as a material for construction.

Iron, as a building material, is still on its trial; what little we know of its conduct under stress points to the fact that it cannot be depended upon to resist strains at all approaching its final limit. The question of how far permanency should be sought at increased first cost, is one that can only be answered for each particular case in which it may arise. But there should be no misapprehension as to what is a permanent and what a temporary structure.

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THE FEMALE SCHOOL OF ART, BLOOMSBURY.

THE annual exhibition of students' drawings at the Female School of Art, Queen-square, Bloomsbury, commenced on Thursday week. Subjoined is a list of the prizes:—A national gold medal, also a national bronze medal, and Princess of Wales's Scholarship to Miss Emily Selous, now Mrs. Fennessy, for an original study in modelling. The Queen's gold medal and a national bronze medal, book prize, and a third grade prize to Miss Alice Blanche Ellis, for an original design of a fan, and other drawings. The Queen's Scholarship, value £30, and a national bronze medal to Miss Emily Austin, for water-colour drawings. A silver medal to Miss Julia Pocock, for an original study in modelling. A silver medal to Miss Ellen Hancock, for a study from nature in tempera. National book prizes and third grade prizes to Elizabeth A. Dorrington and Anne E. Hopkinson, for water-colour studies. Third grade prizes for water-colour drawings, designs, and other drawings, to Ellen Ashwell, Louisa Baxter, Elizabeth Hodge, Eleanor Manly, Jennie Moore, Mary Ann Pickering, Edith Tegetmeier, Mary Whiteman Webb, Charlotte Amelia Austen, Susan Ruth Canton, Alice Hanslip, and Rosalie Watson.

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The parish church of Kirk Deighton, near Wetherby, was reopened after restoration on All Saints' Day. The foundations have been thoroughly repaired, the plaster removed from the inside of the tower, and the interesting work of the south doorway restored. The porch, nave, and aisles now alone need dealing with to complete the restoration of the building.

A NEW FORMULA FOR THE LENGTH OF AN ARC.*

WE find in very few books a formula for the determination of the length of an arc when the chord and the versed sine are given. And in the cases in which one is given it is so complex as to be difficult of application, and besides, requires the use of trigonometrical tables. A formula is to be desired which will give a direct approximate result, and we claim that the one deduced in this article is sufficient for all practical purposes, while it is very simple, and admits of graphic construction. The formula is: The arc-length

$$B = 2\sqrt{a^2 + h^2} + \frac{h^2}{3a}$$

in which a is the half-chord and h the height or versed sine of the arc.

To obtain the length by construction: The value $\sqrt{a^2 + h^2}$ is represented by the hypothenuse B D of the triangle B C D, 2 B D corresponding with the first part of the formula. From similarity of triangles

$$M n : A M :: D C : A C$$

$$\text{or } M N : \tfrac{1}{3} h :: h : a$$

$$\text{hence } M N = \frac{h^2}{3a}$$

the second part of the formula. We may make A K = h, and take one-third of K L = $\frac{h^2}{a}$. This value is represented in C E, obtained by erecting the perpendicular D E to A D.

From A D E

$$C D^2 = A C . C E$$

$$\text{hence } C E = \frac{h^2}{a}$$

The following tables show the degree of exactness of the formula. In Table I. actual magnitudes are given; in Table II. are given the results obtained by the formula.

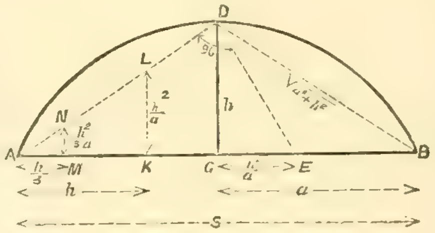

TABLE I.

Angle at Centre.	Correct Arc Length.	Half Chord.	Versed sine.	$\frac{h}{a}$	$\frac{h}{s}$
10	0·17453	0·08716	0·00381	0·044	0·022
30	0·52360	0·25882	0·03407	0·132	0·066
50	0·87266	0·42262	0·09369	0·222	0·111
70	1·22173	0·57358	0·18085	0·315	0·158
90	1·57080	0·70711	0·29289	0·414	0·207
110	1·91986	0·81915	0·42642	0·521	0·260
140	2·44346	0·93969	0·65798	0·700	0·350
180	3·14159	1·00000	1·00000	1·000	0·500

TABLE II.

2δ Angle at Centre.	B Approx. Arc Length.	B − b Error.	$\frac{1000\,(B - b)}{b}$ Ratio of Error.	$1 : \frac{B - b}{b}$ Ratio of Correctness.
10	0·17453	0·00000	0·00	—
30	0·52360	0·00000	0·00	—
50	0·87268	0·00002	0·02	1 : 50000
70	1·22183	0·00010	0·07	1 : 12000
90	1·57117	0·00037	0·24	1 : 4000
110	1·92099	0·00113	0·58	1 : 2000
140	2·44788	0·00442	1·80	1 : 600
180	3·16176	0·02017	6·42	1 : 150

It is seen that the results (B) are throughout larger than the actual values. The error, beginning with a value of zero, at first increases slowly, being $\frac{1}{4000}$ at 90°, while between 90° and 180° it increases rapidly. It follows that in practice the error is of no account.

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* Abstract. Translated from "Zeits. des Ver. Deut. Ing."

CRAGSIDE, NORTHUMBERLAND.

ON the 10th of May last we gave a perspective view of this picturesque house, erected for Sir Wm. Armstrong under the able architectural direction of Mr. Norman Shaw, A.R.A. We now give the bird's-eye view of tower, and fireplace of dining-room, both referred to in our description which accompanied perspective in May last. The masterly drawings, of which we give photo.-litho. reproductions, were exhibited at the Royal Academy this year.

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NOTTINGHAM SCHOOL OF ART.

THE annual meeting of the Nottingham School of Art was held on the 30th ult. The Report of the Head Master. Mr. John S. Rawle, stated that the number of students on the books (504), although 16 less than last year, is, however, 71 above the average number for the past seven years. There were 369 male students who joined the evening classes, and during the 205 working nights of the year attended 16,917 times, giving an average of about 46 attendances per year for each student. In April last were forwarded to South Kensington 2,426 works, executed in the school during the previous twelve months, by 335 students. 48 students contributed 304 works in the advanced stages of instruction, and 287 students sent up 2,122 elementary works. From the above advanced works 47 were selected by the Government examiners, to enter the lists of the "National Art Competition." There were 32 Nottingham works publicly exhibited at South Kensington Museum; the total number of works hung from all the 117 schools being 617, giving an average of about five works from each school. The school obtained in the National Competition two silver and three bronze medals, and five Queen's prizes; total, 10 awards (last year 13). Also 23 Government art prizes (last year 23), two season tickets of admission to the Royal Academy (last year two) and 15 free studentships (last year 20). The prize works consist of drawings and paintings from the cast, flower drawing and painting, groups in oil, as compositions in colour, designs for lace, ribbons, and wall decorations, &c. In the annual Government examinations, which were held in the school last April, 272 students presented themselves for examination (219 males and 53 females). As many as 417 papers were worked, the greatest number ever worked at an examination at this school. Of these papers, 70 were marked by the Government examiners as "excellent," and 143 obtained "certificates of proficiency;" total, 213 successful papers. The school also obtained 24 "full certificates." In the Government examinations of 1871, the school, for the fourth consecutive year, took a greater number of prizes than any other school in the kingdom. This fact, taken in connection with another, viz., that in the list of bonuses awarded by the Government to art-masters Mr. Rawle's name stands first among the provincial head-masters, must be very encouraging to all connected with the school.

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AN INTERESTING DISCOVERY.

THE President of the Royal Institute of British Architects, in the course of his inaugural address on Monday evening last, said he had been informed by one well qualified to speak on such a topic, that amongst the recent additions to our knowledge of ancient architectural art one of the most important has been the discovery of a Sassanian palace, in the desert behind the Dead Sea, by the Rev. Mr. Tristram in the spring of the present year. This palace, which dates from the first year of the seventh century, is the only specimen of the decorative style of that age which is known to exist, and supplies, in part at least, the missing link that was wanted to connect the styles of the West with those of India, and enables us to understand much in the Saracenic architecture of Persia and India which has hitherto been wrapped in mystery. The details of the building, which are of extreme beauty and delicacy, will probably soon be published by the discoverer, and will no doubt prove a most interesting addition to our knowledge of the thousand and one styles in which mankind has expressed the idea of beauty and fitness in architecture. At some later period in the session it is probable that Mr. Fergusson will be able to give some further information on this interesting discovery.

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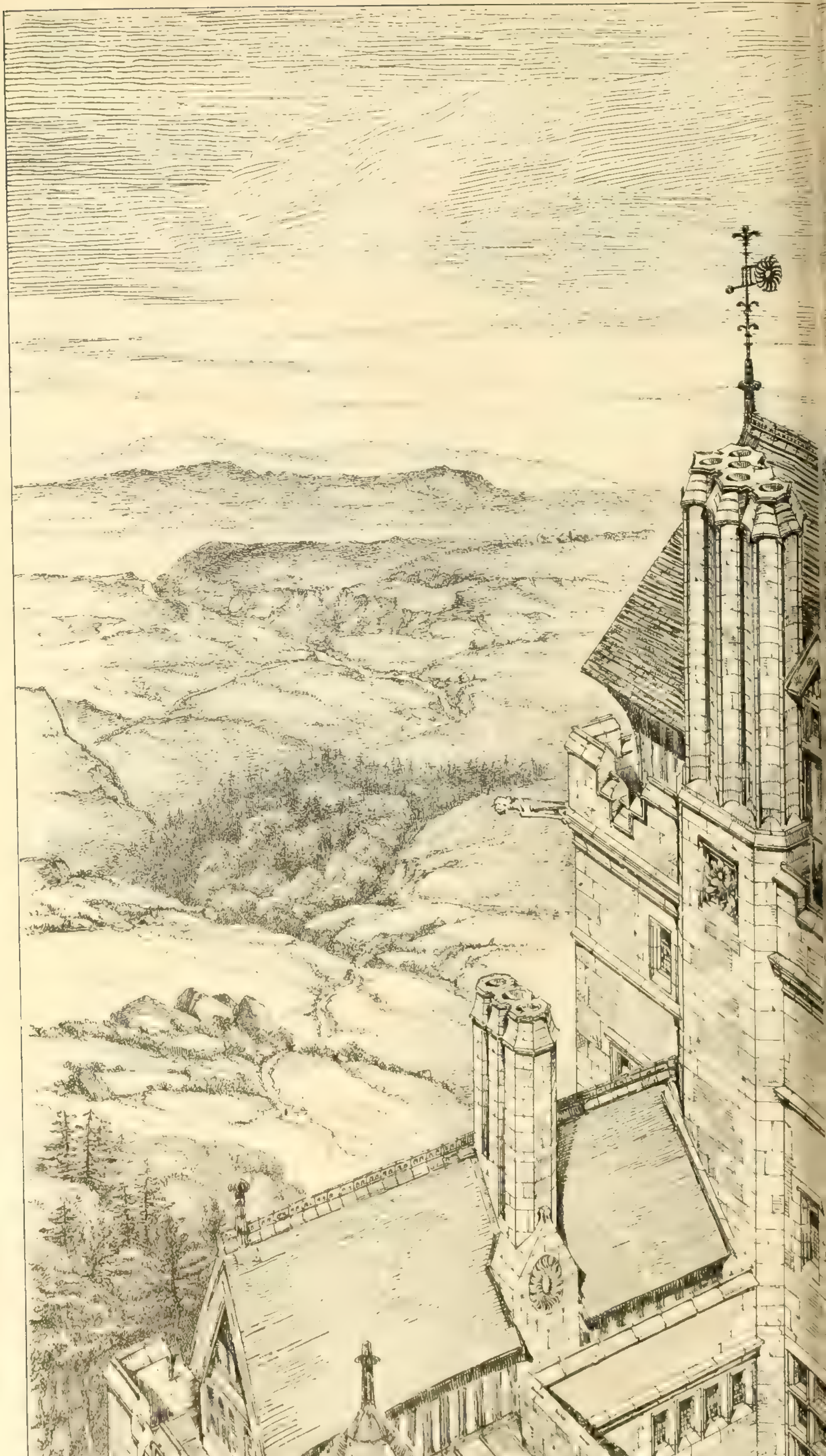
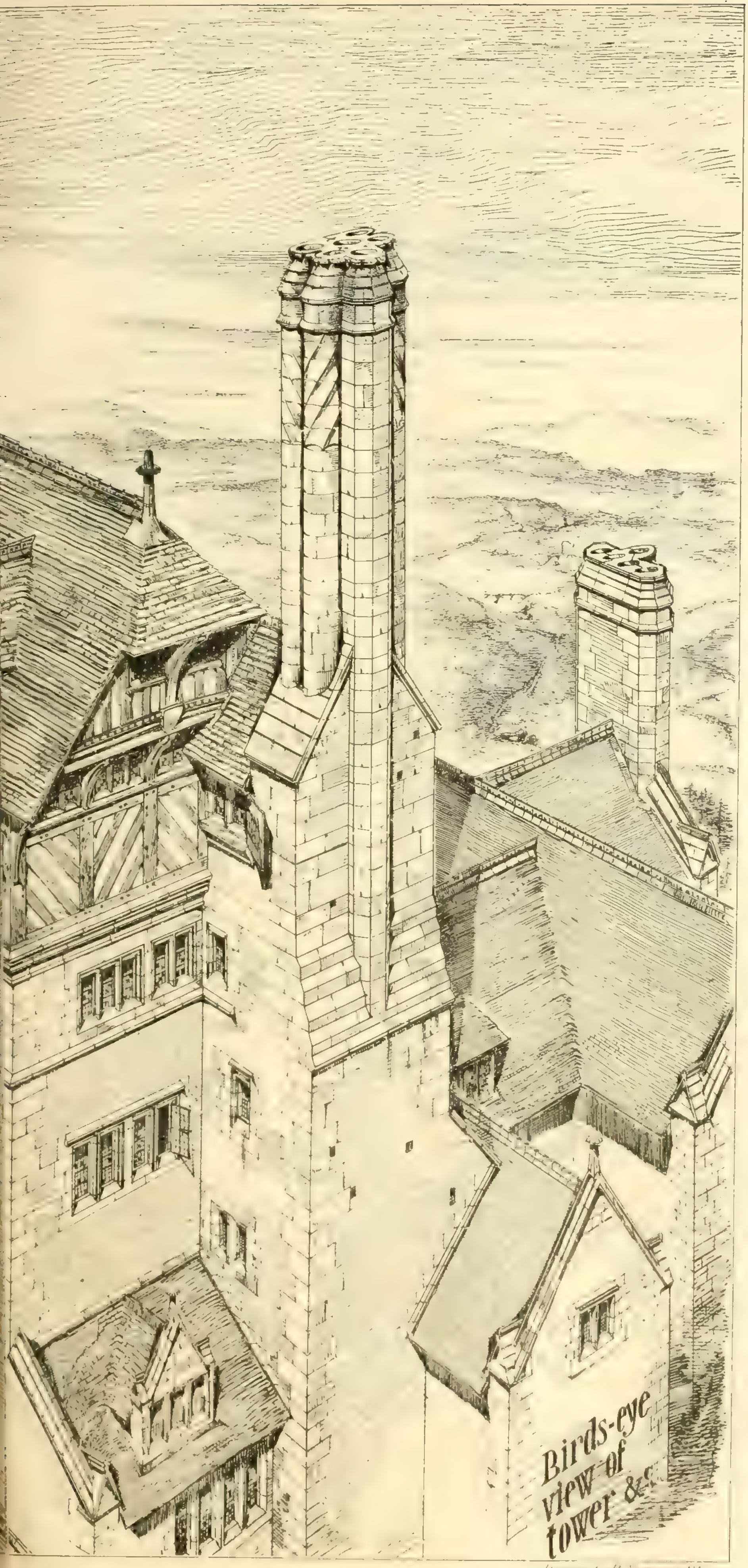
On All Saints' Day a new church was consecrated at Worlestow, Cheshire. The building is plain, and consists of nave, aisles, transept, and chancel. The walls are of stone, the interior being left roughly chipped. The east window has been filled with stained glass as a memorial to the late Bishop Cotton, of Calcutta.



CRAGSIDE, NO

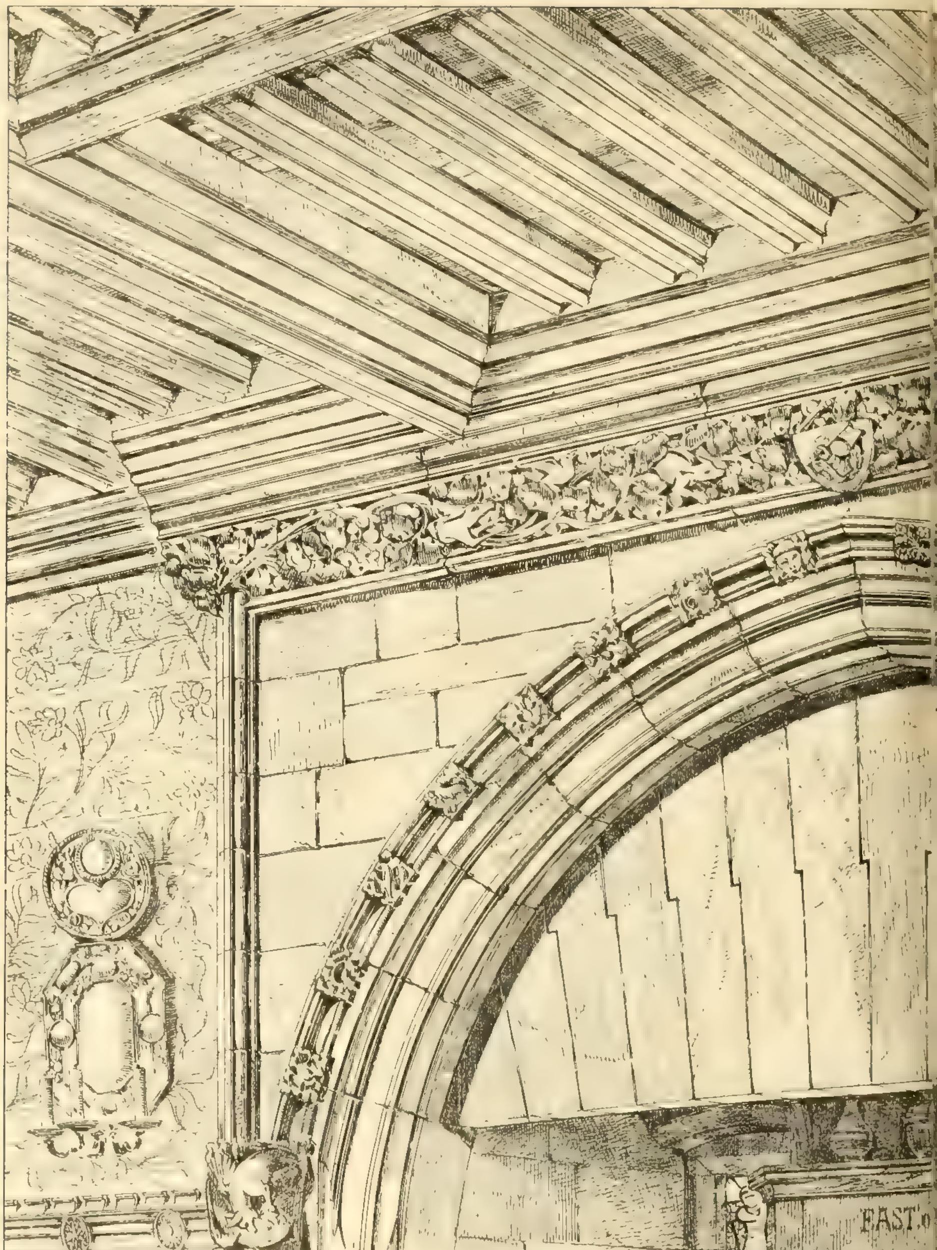
R NORMAN S


Birds-eye view of tower &c.

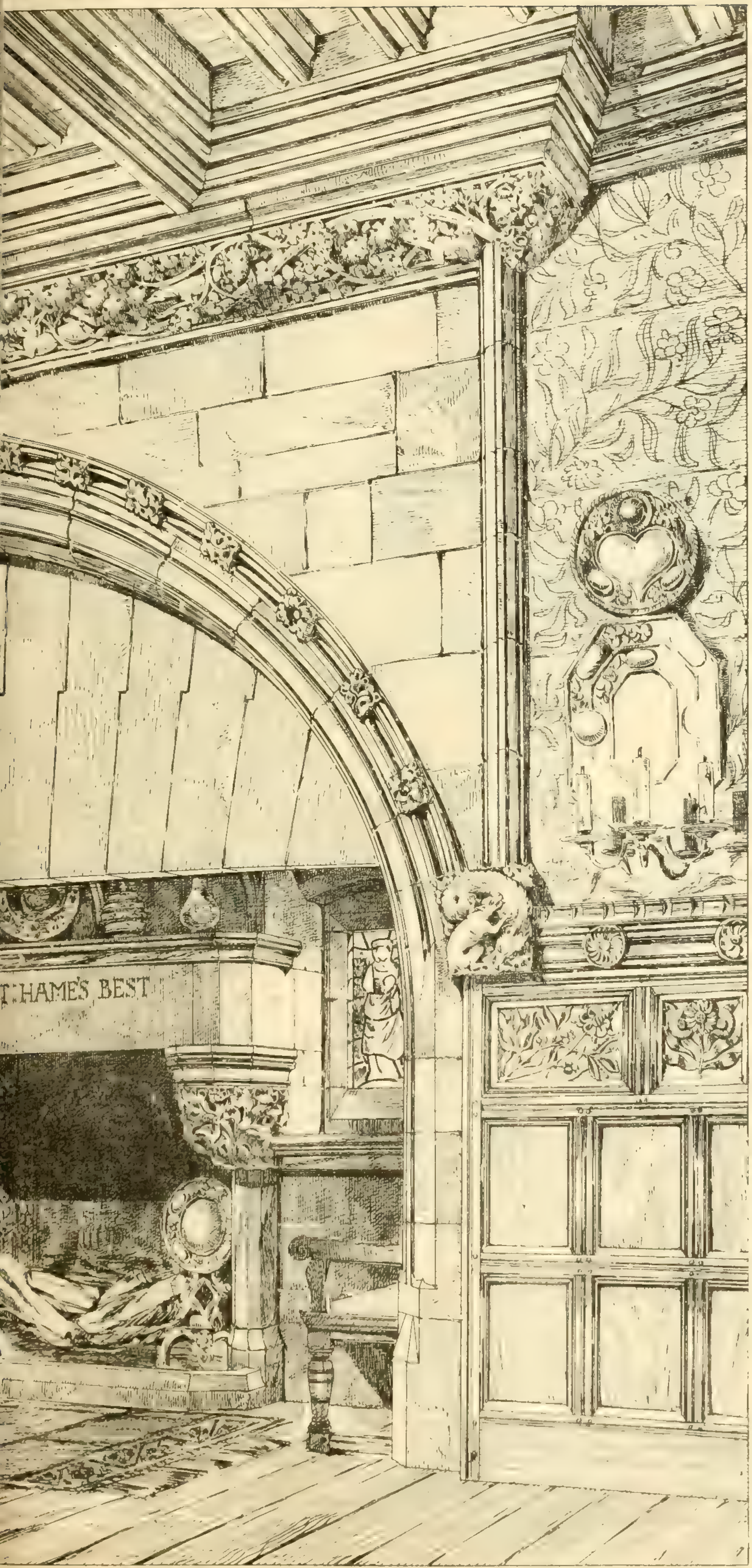
Drawn by R. Norman Shaw

UMBERLAND.

A ARCHT



Cragside: Northumberlar
Fireplace in Dining Room


T. HAME'S BEST

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Civil Engineering.

Burntisland New Dock Works.—The Town Council have accepted the estimate of Mr. Walter Scott, Newcastle, for constructing the dock, amounting to £40,250. The work of excavation will be begun immediately, and the contractor is obliged to complete the undertaking within a period of two years. Mr. Scott is at present constructing extensive dock works at West Hartlepool.

Edinburgh Water Works.—Mr. Ayris, C.E., Norwich, is now in Edinburgh making investigation regarding the distribution of water and internal arrangement of house fittings, with a view to the suppression of waste.

Leith Harbour.—The works connected with the extension of the Commercial Graving Dock, after having been in hand for upwards of eighteen months, have just been completed. Considerable delay was caused by an accident which happened to the gate, sill, and platform. The Queen's Dock, from which the Graving Dock enters, was laid dry to admit of the old entrance to the Graving Dock and its adjacent quay walls being removed and extended. This done, and a coffer-dam—of horizontal logs piled one above another, caulked, bolted, and framed together, and supported from within—having been placed in front of the entrance (which is 50ft. wide) the water was readmitted into the Queen's Dock. Shortly after high-water, and when the full pressure was on the dam, the water found its way beneath the masonry of the newly laid sill and platform, lifting it bodily out of its place, flooding the dock, and causing considerable damage to plant and works then going on within the dock. The dock has been lengthened about 50ft. at each end, and its total length is now 250ft. It will afford important additional accommodation to the shipping trade, which is rapidly increasing. The engineer was Mr. A. M. Rendel, London; the contractors were Messrs. Macdonald & Grant, and the cost, inclusive of gates, shuttles, and engine-house, was about £15,000.

Harbour and River Improvements in India.—Mr. Robertson, C.E., Edinburgh, has returned from India, having completed his inspection of the harbours and river mouths of that country with a view to their improvement. The harbours of the Madras Presidency were visited last year, and the Madras Government have decided upon carrying out the suggested improvements with the least possible delay, and have also applied for sanction to construct a breakwater at Madras, estimated by Mr. Robertson to cost one and a third million sterling. This year the harbours of the Bengal and Bombay Presidencies were inspected from Chittagong on the east to Kurrachee on the west coast of India. Mr. Robertson has also recently examined for Government the site of the proposed ship canal at Paumben, between Ceylon and India, a subject of increasing importance to the trade of Calcutta and Madras. Thirty-four places in all have been examined within the last two years.

Society of Engineers.—At a meeting of the Society of Engineers held on Monday evening last, Mr. Jabez Church, President, in the chair, the paper read was on "Milford Haven and its New Pier Works," by Mr Henry Davey, C.E. The author commenced by referring to the natural advantages of Milford Haven, which Lord Nelson once pronounced to be one "of the best harbours in the world." Although there was a mean fall of 22ft. at spring tides, the largest fleet could at all times easily find shelter and security in the haven with good working room. The area of the main portion of the estuary from Blackhouse Point to Cosheston Pill, above Pembroke Ferry, was stated to be at high water 8,810 acres, and at low water 6,855 acres. At 1 fathom deep at low water, spring tides 5,354 acres; at 3 fathom ditto 4,245 acres; at 5 fathom ditto 2,951 acres. The author considered that the great rise of tide offered every advantage for the construction of graving docks in the port which he recommended. The author also advocated the extension of piers and engineering works for ship accommodation in the haven, his reason being that the estuary, from its geographical position, as well as for other important reasons, was admirably adapted for an extensive export and import commerce. The author then described by the aid of drawings the new iron pier at Newton Noyes, which runs out from the mainland into deep water. It is provided with three lines of rails, and is connected with the Great Western Railway at Milford Station by means of a short line running along the north side of the haven, near the foreshore. The main portion of this pier is 600ft. long and 50ft. wide, supported on four rows of wrought-iron piles in 20ft. bays. At the outer end an L piece is built at right angles to the main portion, measuring 180ft. in length, and of the same construction as the other part. The pier is provided with hydraulic hoists, cranes, capstans, &c., and has every arrangement for the convenience of shipping. The mechanical arrangements were carried out by the author, under Mr. Bower, the contractor and lessee of the pier.

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LEGAL INTELLIGENCE.

Benefit Building Societies.—Among the "slaughtered innocents" of the late session, the Building Societies Bill was one which deserved a better fate. It was first introduced to the House in 1870, and the three sessions in which it has been under discussion have given ample opportunity for perfecting its details. The general purposes of the Bill of 1870 were discussed at the time in the *Law Magazine and Law Review* (Vol. XXIX., p. 323). Its principal object was to consolidate the law of benefit building societies, a measure the necessity of which has long been apparent; for the present Building Societies Act of 1836 (6 and 7 Will. IV., c. 32) consists not only of its own clauses, but of all such of certain ancient and long-repealed Friendly Societies Acts (10 Geo. IV., c. 56; 4 and 5 Will. IV., c. 40) as may be held to apply to the societies in question. To substitute for the perplexing uncertainty which this causes, one definite enactment would alone be a valuable improvement; but more than this is necessary to relieve benefit building societies from the embarrassments in which they have been involved. First, the power to borrow must be granted, defined, and limited; and the directors and managers of these societies relieved from the heavy responsibility many of them have incurred in this respect. Second, provision must be made for the realisation of the properties of these societies in the event of winding-up, by a method less ruinously costly than the compulsory process of the Court of Chancery. Third, the scheme of legislation must be adapted to the present state of the law with regard to friendly societies, and to those more enlightened modern views which tend to simplify the incorporation of societies, and to sweep away the cumbrous machinery of trusteeship. All these objects were proposed by the Building Societies Bill of the session just closed. and the great magnitude of the interests affected gave some hope that they might have been attained. The Government, however, interposed a suggestion for bringing these societies under the Joint-Stock Companies Act, but the Royal Commission on Building Societies reported against it. They were disposed to recommend the establishment of some more stringent check upon ill-advised schemes and inequitable proceedings than is now available, or than the Bill contemplated; and between these widely-divergent views, the Bill fell through. While future legislation becomes matter of discussion from first principles, it is to be hoped that the next session will not pass without some measure to remedy the pressing defects of the past, and place these societies in a position to profit by any future measure for their regulation that the wisdom of Parliament may devise. Few persons are aware of the extent of the transactions of these societies, or of the amount of real good which has been effected through their instrumentality. The amount annually distributed by them in the form of advances for building may be measured by tens of millions of pounds, and the number of persons who owe their independence as house-owners to these societies, by hundreds of thousands. While the benefit building societies established under 27 Will. IV., c. 32, have failed to receive the protection they require, all the privileges they seek have been given to societies with precisely the same object, and with much wider scope of operation, under the Industrial and Provident Societies Act of 1871. We believe that already a great number of societies have been incorporated under this Act, and these societies possess power to buy and sell land, to borrow money, and to act as corporate bodies, and have all the privileges of the Industrial and Provident Societies Acts. As this movement develops, it will become more and more evident that the same privileges must be granted to benefit building societies.—*Law Magazine.*

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The Tabernacle Chapel, Hanley, was reopened on Sunday last, after redecoration.

The foundation stone of a new fever hospital was laid on Thursday, at Denling. The cost will be £9000. Mr. G. G. Hoskyns is the architect.

New schools were opened at Leicester, by the Bishop of Peterborough, last week. Mr. Goodacre, of Leicester, was the architect, and Messrs. T. & H. Herbert, of Leicester, the builders.

A gentleman, who declines to publish his name, has given £2,500 to the Birmingham and Midland Institute, for the purpose of encouraging the study of the science of health amongst the working classes.

The chimes, clock, and carillons now being made for the Bradford Town Hall, by Messrs. Gillett & Bland, of Croydon, will cost about £4,500. The set of carillon bells will be the largest in the world, weighing 3,261cwt. 3qrs.

Building Intelligence.

CHURCHES AND CHAPELS.

Birmingham.—On Tuesday week the first services were held in the new Baptist Chapel at King's Heath, Birmingham. The chapel is an oblong building, with gallery at one end, is capable of accommodating 350 persons, and has cost £1,200. In the interior it has an open-timbered roof, a speaking platform, and low seats. The front is of Gothic design, carried out in red brick, with stone dressings. The schools at the back are capable of accommodating 300 children.

Bristol.—The works in connection with the restoration of the Temple Church, Bristol, are proceeding satisfactorily. A trench, from 4ft. to 6ft. deep, has been made around the exterior walls to protect them from damp. The flooring in the two chapels is likewise being lowered. The pillars have all been cleaned and two new side roofs constructed. It is intended to form a baptistry at the western extremity of the church, the old font, in which it is believed Edward Colston was christened, being in course of renewal in order to be here placed. When the inside has been finished the tower, external jambs of the windows, and other outside features, will demand attention. The "leper" windows serve to identify the church with the Knights Templars; the reminiscences of the weavers recall many incidents dating from the Reformation; and the last discovery, two piscinas in the north and south aisles, testify to the former existence of altars in these portions of the structure.

Gloucester Cathedral.—The new reredos in Gloucester Cathedral, the gift of the Freemasons of the province, is now nearly completed, but, as the restoration of the sedilia is far from finished, the cathedral will probably not be opened until next spring. The reredos is about 20ft. long, and from the floor to the top of the cross which ornaments the central pinnacle is 27ft. There are seven niches. three of which are occupied by sculptured groups, and the other four by statues. The figures and groups are each between 4ft. and 5ft. in height. The figures are those of Moses, S. Peter and Paul, and David; the groups represent the Nativity, Entombment, and Ascension of Jesus Christ. They have been sculptured in the studio of Mr J. F. Redfern, of London; the canopies and other work are by Messrs. Farmer & Brindley. Stone from the Cotswold range has chiefly been used. The restoration of the south porch has now been completed, the corbels on which the figures of S. Peter and Paul and the four Evangelists rest having been carved.

Jedburgh Abbey.—For some time past fears have been entertained for the safety of the tower of Jedburgh Abbey, and the Marquis of Lothian recently consulted Mr. Anderson, architect, Edinburgh, who recommended that a flying buttress should at once be thrown up against the north-west pier of the tower, so as to afford a temporary support, and this has already been done. The two piers towards the north are Norman in style, like the lower part of the choir and what remains of the original transepts, and belong to the early part of the twelfth century; while the south piers and the greater portion of the tower were built in the fifteenth century. What is known as the Edgerston monument, executed in the later Gothic style, had long been felt to be out of place, standing as it did in the middle of the chancel near the site of the high altar, and has now been removed to a more appropriate situation. During last week a considerable quantity of earth was removed from the north aisle of the nave, which has exposed part of the side wall, and a portion of the beautiful base of the north transept—fifteenth century work—has also been laid open to view. Other improvements are being carried out. The greatest improvement of all, however, will be the removal of the parish church from its present place in the west end of the nave, a work which will be accomplished in a few years at most, and when cleared of all modern patchwork, the beautiful proportions of the nave, an exquisite example of the transition between the Norman and Early English, will be seen.

Lindley.—A new chancel, 23ft. by 21ft., has just been built to the Lindley parish church, near Huddersfield, with organ chamber on the north side, 16ft. by 12ft., and minister's and choir's vestries on the south side. The roof of the church, which had a flat plaster ceiling in one span of 45ft., has been taken down, and a new hammer beam open roof has been substituted. The whole of the chancel portion has been built with the best local stone, and has a large five-light traceried window, which has been filled in with stained glass, supplied by Messrs. Ward & Hughes, of London. The style of architecture adopted is that of the fourteenth century. The church was reopened for public worship on Monday last, the 4th inst. There is a handsome reredos at back of altar, with arcading, the full width of chancel, with returns on side walls as far as communion rails; this has been done in stone and encaustic tile work, supplied by Mr. Knowles, of York. The works have been executed by local contractors, in separate trades. Mr. James N. Crofts, of Liverpool, was the architect. The cost of the whole, including some new pewing in nave and choir stalls, &c., but without stained glass and new organ, has been about £1,100.

Nocton.—On All Saints' Day, the church of All Saints', Nocton, Lincolnshire, was reopened by the Bishop of Lincoln, after the addition of a south aisle, a richly decorated porch, and an elaborately carved alabaster reredos. The present church of Nocton was erected ten years since by Sir Gilbert Scott, employed by Lady Ripon. The building is in the Early Decorated style, and comprised, when first opened, a nave, chancel, and mortuary chapel to the south. On the south side of the nave the foundations of the new aisle were laid, and the arcade constructed in the wall so as to admit the addition without trouble or inconvenience. A south porch has also been erected, with a groined ceiling decorated with niches containing statues of SS. Peter, John, and Paul, and John the Baptist. The reredos, executed from Sir Gilbert Scott's designs by Messrs. Farmer & Brindley, consists of three elaborately carved pedimented niches, containing panels in relief representing our Lord benring the Cross, the Crucifixion, and Entombment. The wall on either side of the altar is arcaded in alabaster, the wall spaces containing groups in incised lines representing "All Saints."

Rowington.—On Wednesday week the parish church of Rowington was reopened, after restoration. The building has been refloored and reseated throughout, the windows reglazed, and a stained window inserted over the altar. The ceiling of the north aisle, the walls of the choir, and the organ-loft have been painted in brilliant colours. The restorations are jointly the work of Mr. Jno. Hall Clarke, builder, Warwick, and Mr. Franklin, of Deddington, near Coventry.

Tarrington.—The parish church of Tarrington was reopened on All Saints' Eve, after restoration. The building is of Norman origin, and the restoration has been effected by Mr. F. K. Kempson, of Hereford. The chancel floor has been raised one foot above that of the nave, and laid with Godwin's encaustic tiles. Much of the stone work and ancient carving, thickly coated with plaster, has been laid bare and well pointed. The lath and plaster ceiling of the nave and chancel has been replaced by a vaulted panel roof in pitch pine, intersected throughout by bold ribs in red deal. High-backed and closed pews have been converted into low, open seats. It was found necessary to rebuild the south wall, in which three new windows have been erected. A new chancel arch has also been built. The stonework of the west window is entirely new, and that of the east window nearly so. The entire cost somewhat exceeds £1,000. The contractors were Messrs. Collins & Cullis, of Tewkesbury.

BUILDINGS.

Bristol.—The restoration of the old Merchant Venturers' Hall in Marsh-street, Bristol, is now completed. The exterior of the new buildings contrasts strongly with the hall proper, which still retains its old position. On either side of the entrance, in the interior of the building, are the clerks' offices, whilst immediately fronting it is a flight of about twenty steps, terminated by a Norman arch leading to a spacious corridor which runs at right angles with the staircase. From the corridor to the committee-room access is obtained through a door, which stands halfway down. The committee-room is 33ft. long by 24ft. wide, and the height is 19ft. The ceiling and walls are enriched by handsome panels, whilst pilasters with carved capitals intersperse the panels of the walls. Altogether, the new building has been erected at a cost of about £1,000, by Messrs. R. Wilkins & Sons. The architect is Mr. J. A. Clark, of Broad-street, Bristol.

Lincoln.—The new Masonic Hall at Lincoln was opened on Tuesday week. The building consists of a sale-room, concert-hall, cloak and retiring rooms, and other conveniences on the ground floor, and lodge, reception, preparation, and store rooms, lavatories, &c., on the first floor. The concert-hall is 78ft. by 32ft., and 27ft. high, and will seat an audience of [illegible] people. The principal entrances and staircases are laid with encaustic tiles by Minton, Hollins, & Co., of Stoke-on-Trent. The front portion of the building on the first and upper floor is devoted to the purposes of of Freemasonry. The reception-room is 25ft. by 18ft., and 14ft. high. Mr. [illegible] W[illegible], of Lincoln, was the architect, and the whole of the work has been executed by Messrs. Otter & Binns, the builders.

Liverpool.—On Tuesday afternoon the Mayor of Liverpool formally opened the new Liverpool Institution for Infectious Diseases. The hospital is constructed to accommodate, in the first class, fourteen males and eleven females; and in the third class, thirty-five males and twenty-five females—in all, 100 patients. The hospital has been erected by Messrs. Haigh & Co., from the designs and under the superintendence of Mr. S. Cook, architect of this town, whose plans were selected as the most suitable of the sixteen sets submitted by various architects. The hospital consists of two pavilions, placed 100ft. apart, and connected by a corridor 10ft. wide, in the centre of which is the block, comprising the rooms for surgeon and matron, main entrance, kitchens, stores, &c., and forming the administration department. Every room is 13ft. high, and the cubic space allowed for each person varies from 1,300 to 1,500 cubic feet. The cost of the buildings, including additional foundations and internal fixtures, will be about £6,350; heating apparatus, piping, and hoists, amounts to £750, making the total expense, exclusive of furnishing, about £7,100.

Liverpool. — The foundation stone of the new Masonic Hall at Liverpool was laid on Saturday last. The design for the new hall is Italian, and was selected in competition. The front to Hope-street will be built of whitestone. The principal entrance in the centre of the front is approached by a broad flight of steps, and protected by a spacious projecting porch, flanked by columns and pilasters with carved capitals. The basement is devoted to two club-rooms, each 25ft. by 20ft., with ante-rooms, store-rooms, wine-cellars, &c., a corridor, 10ft. wide, running from the front to rear. The ground floor consists of library, 25ft. by 20ft., and committee-room of similar dimensions. The lodge-room is placed at the back, and is 51ft. 6in. long by 30ft. wide. On the first floor will be the chapter-room, 51ft. 6in. by 25ft., with three ante-rooms, and the dining-hall, 51ft. by 30ft., at the back, with ante-rooms, serving and dressing-rooms, and a spacious ladies' gallery. The upper floor is devoted to kitchen purposes. The architects are Messrs. Danson & Davies, of Liverpool, the sole contractor being Mr. Joshua Henshaw.

Liverpool.—The new Stanley Hospital, Liverpool, erecting from designs by Messrs. Duckworth & Metcalf, is nearly completed. The estimated cost of the building is £7,750. The exterior is constructed of Bolton red brick, with Wootton red stone dressings, and has a substantial aspect. The central portion projects slightly beyond the line of the main building, is carried up an extra story, having a clock tower, and being covered with a French roof. At each end of the building is a slight projection, which breaks the regularity of the façade, and will, when the whole structure is completed, be considerably extended on either side, for it is part of the original plans to construct wings, on the cottage principle, running from each end and from the rear of the building. The portion now erected is simply that originally designed for administrative purposes, but it will be utilised as the hospital proper until the committee are in a position to carry out the complete plans. The principal entrance is a handsomely-proportioned vestibule, 19ft. by 12ft., having a tiled floor. This vestibule opens into a corridor, 7ft. 3in. wide, and running the full length of the building. There is a similar corridor on every floor. To the right from the vestibule is that portion of the hospital appropriated to the treatment of out-patients, who have a separate entrance. The waiting room—one of the finest in the building—will accommodate 200 persons, Mr. Hugh Dyer is the contractor for the building.

Whitchurch.—The new market at Whitchurch, Salop, was opened on Friday week. The plans were prepared by Mr. Lockwood, of Chester, and the work has been executed by Mr. Stringer, of Sandbach. The building has a frontage of about 76ft. The front portion consists of a corn exchange, about 56ft. in length, and an average width of 32ft., having three separate entrances. Adjoining are placed the offices of the Local Board and their board-room. Above these apartments, and occupying the entire first floor, is the large public room, 63ft. 6in. in length, and 41ft. in width, and about 24ft. in height to ceiling. The basement of this front building consists of three large cellars. The general market stands immediately behind the front block, and is 126ft. in length by a width of 60ft., the side walls being 18ft. 6in. in height. The whole area is roofed in one span. The market roof is provided with large skylights and ventilating louvres running the entire length of the building. The style adopted for the front portion of the building is Gothic of the thirteenth century, the materials used being red brick and Grinshill stone, simply treated. As a central feature a gable has been carried up, which is terminated by a bell turret with vane, the height of which is 72ft. from the ground.

SCHOOLS.

Birkenhead.—New Church of England schools have just been opened in Birkenhead, in connection with S. Paul's Church. There is accommodation for a little over 500 scholars, and there is a boys' school on the ground floor, 69ft. by 20ft., with class-room, 19ft. by 15ft. The girls' school, on the first floor, is of same size. At the back there is an infants' school, 50ft. by 28ft., in one story, with open roof, having class-room 18ft. 2in. by 13ft. 6in. All have detached conveniences, coal, and ash place, with cellar for tea boiler, and good-sized playgrounds. These schools, which are situated at the corner of Wilbraham-street and Borough-road, have been erected complete for £2,044. Mr. David Readdie, of Liverpool, was the contractor, under the superintendence of Mr. James N. Crofts, architect.

Heckmondwike.—At a meeting of the School Board for the district of Heckmondwike held on Monday night, a letter was read from the Education Department as to certain alterations in the plans of the proposed new schools, another suggesting that the cost was too high, and a third sanctioning the erection of the Battye-street school, and saying that the department would recommend the Public Works Loan Commissioners to lend the money required for the erection of the building, and to allow the repayment to be spread over fifty years. The cost of the building, &c., exclusive of the master's house and site, is estimated at £4,774, or £8 6s. 1d. per scholar. The architects were instructed to prepare the necessary specifications, &c., so that contracts might be let without delay.

Middlesborough.—At the monthly meeting of the Middlesborough School Board, held on Monday afternoon, it was stated that the plans of the Gladstone-street school, prepared by Messrs. Alexander & Henman, could not be carried out for less than £7,000. Amended plans upon a reduced scale, estimated to cost £5,000, were now submitted and referred to a sub-committee of the Board. Some conversation followed as to Messrs. Alexander & Henman's remuneration for work already done, and it was arranged that they should be paid £150 in full of all claims.

S. Stephen's, Schools, Spitalfields.—The ceremony of opening these newly-erected schools took place last week. The schools, which are of brick, and of handsome elevation, have been erected from the design of Messrs. Stone, architects. They are of three stories. The basement is a drill ground, and the three stories are for infants', boys', and girls' school-rooms, each story being capable of accommodating 200 children, so that there is accommodation for 600 altogether. The school has cost £6,000.

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LAND AND BUILDING SOCIETIES.

Kirkcaldy Property Investment Society.—The annual meeting of this Society was held in the Town Hall on Wednesday night. The report for the year showed an increase over last year of £5,467 10s. on the amount advanced on property, and of £3,291 6s. 11d. on the amount held on deposit. The total number of members on the roll was 304, holding 1,698 shares, as against 240 holding 1,181 shares. Out of the profits of the Society the directors have placed 5 per cent. at the credit of the investing members, and after paying interest, working, and other expenses, carried to the contingent fund £90 15s.

Oxford.—The twelfth annual meeting of the Oxford Working Men's Land and Building Society was held on Thursday week. The twelfth annual report stated that the directors, upon a careful consideration of the balance in hand, have voted a bonus of 3 per cent. upon the year. This, together with the quarterly addition of 5 per cent. through the year, may safely be considered as equal to 10 per cent. upon the year, and will then leave a good reserve in hand. The statement of accounts showed that the receipts during the past year had been £2,026 11s. 11d., and that there was a balance of £10 6s. 8d.

◆

A memorial column and drinking fountain, erected in honour of the late Mr. Sheriff Young, was inaugurated at Wisbech last week. Mr. J. Wallis Chapman, of the Harrow-road, London, was the architect; and Mr. John Whitehead, of London, the contractor.

We understand that Mr. Street, the architect, is engaged upon the contract drawings and specifications of the New Law Courts, which, it is expected, will be complete by the end of the month, in which case notice for the reception of tenders for the execution of the entire work will at once be issued.

TO CORRESPONDENTS.

e do not hold ourselves responsible for the opinions of ur correspondents. The Editor respectfully requests that all communications should be drawn up as briefly s possible, as there are many claimants upon the space llotted to correspondence.]

o OUR READERS.—We shall feel obliged to any of our aders who will favour us with brief notes of works conmplated or in progress in the provinces.

ll Letters should be addressed to the EDITOR, 31, AVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to PASSMORE EDWARDS.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight ords (the first line counting as two). Special terms for ries of more than six insertions can be ascertained on plication to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted a charge of one shilling for the first twenty-four words, d sixpence for every succeeding eight words.

Advertisements for the current week must reach the ice not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the BUILDING EWS School Planning Competition is extended to the h of November, 1872. For particulars, see BUILDING EWS, August 9, 1872, p. 102, and Answers to Correspondnts, September 6, 1872.

ECEIVED.—J. H. W.—N. M.—C. B. A.—J. E. F.—E. J.—J. N.—J. P. S.—C. M.—Art Student.—A Sketcher.—J. E. M.—E. L.—C. & Co.—S. Bros. & Co.—J. A. S.—E. R. T.

TEPHEN SEAL.—Ask the question on its own merits without reference to any other paper.

TRAIGHT EDGE.—Your letter was unauthenticated, and therefore inadmissible.

R. DALGLEISH writes to say that "A Non-Competitor" was incorrect last week by calling attention to the "Royal Agricultural Society's Cottage Planning Competition." It should have been the "Royal Northern Agricultural Society."

WARD.—You may have the drawings.

COUNTRY SUBSCRIBER.—We hope to be able to gratify you in a few weeks.

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Correspondence.

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VENTILATION.—WITH RULES FOR BUILDING COTTAGES.

BY THE RIGHT HON. LORD KINNAIRD, KT.

To the Editor of the BUILDING NEWS.

SIR,—I beg to send you the enclosed, by Lord innaird's direction, for publication, as he thinks it ay be interesting to your readers. I shall be glad give any further information.—I am, &c.,

D. D. STEWART, Surveyor to Lord Kinnaird.

Castlehill, Inchture, November 2.

In all new buildings, to insert in the wall above the eplace, 2in., 3in., or 4in. clay draining pipes, cording to size of the room; one end of this fixed to an iron tube, or curved clay pipe, inserted into the imney at the commencement of intake behind lintel fireplace (Fig. 1). The clay pipes, or a zinc tube n. by 2in., between the lathe and walls, or between ll and paper, with an opening into the room near e cornice. This opening may be concealed by perrating the cornice (Fig. 2). Thus a syphon is formed, ly acting in the reverse way water acts. The short g draws the foul air down from the ceiling, to ich it first naturally ascends, where it cools and en descends, and is taken by the draught of the fire p the chimney, so that any one sitting at the fire hales this foul air in its passage to the grate. The phon, on the contrary, carries it off as it ascends, d is constantly at work whether there is a fire or t. Of course, a fire makes a stronger draught. nott's ventilator went straight into the chimney, d, therefore, did not act unless the draught in e room was *stronger* than the draught up the imney. If the chimney smokes the smoke will d its way by the syphon apparatus, but when the ling near the aperture is black it sometimes is used by the draught clearing the smoke from the om.

As I have said, in a a new building the pipes ould be built in, but in an old building it is only necessary to break the plaster to let in the tube, or it may project into the room, where the appearance is of no consequence, connected to chimney immediately above the chimney-piece.

For an infirmary, large school-room, or hall, I should recommend, in addition, a 4in. circular zinc pipe to be carried along the cornice (or the cornice might be formed by a pipe round the room), with one or two openings, and to be conducted from all the wards or rooms into a small iron chamber at the top of the house, communicating with a chimney. In this chamber should be a gas-burner, such as is used for cooking. By heating this chamber, the foul air is drawn rapidly off. The size must, of course, depend on the space to be ventilated, but a small chamber is quite sufficient.

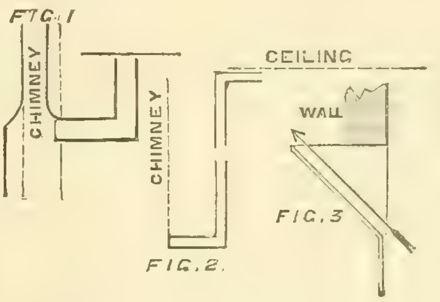
FIG. 1

FIG. 2.

FIG. 3

Next in importance to getting rid of the foul air is the admission of fresh without a draught or inconvenience to the inmates of the room. This can be effected by hanging the *upper* sash at the centre of the window, so that it will fall down into the room, sufficient to clear by 2in. to 4in. the inside lintel of the window (Fig. 3). The sides, when the window is open, are closed. The fresh air thus *strikes* the ceiling, and so becomes diffused, and is not felt as a draught by those occupying the room. For an infirmary I should recommend all the windows being connected by a rod, to open and shut with a lever at one end, which should be kept under lock and key, to be in charge of whoever looked after the sanitary state of the room, to open more or less, as required. The slides may be hinged so as to fold to when the shutters are shut.

Cure for Smoky Chimneys.

Conduct two small pipes, of 1in. or 2in. diameter, from the outside, if possible; if not, from the floor level to about 3ft. up the chimney, the end in chimney to be bent a little to prevent soot entering the pipe.

Rules to be Followed in Building Cottages.

RULE 1.—A drain to be cast, 6ft. deep, round the cottage, at a distance of 3ft. from the outside of walls, with gratings for waste water.

RULE 2.—The floor of the cottage to be raised from 8in. to 1ft. above the level of the adjoining ground, and filled up to the breadth of 18in. with broken metal round the interior walls, and close up to the flooring, to keep out rats.

RULE 3.—The one-story cottages to consist of kitchen, small room with fireplace, two sleeping closets off the kitchen, or kitchen and two sleeping rooms, with fireclay grates and scullery, each with windows, interior porch, partitions of brick and wood, with small openings near the ceiling from sleeping rooms into kitchen for ventilation.

RULE 4.—Walls to be lined internally with hollow bricks, plastered, with recesses for cupboards.

RULE 5.—Common clay circular pipes to be built into upper part of chimney. Back of fireplaces to be made concave.

RULE 6.—A 3in. drain-pipe to be built into the wall at basement, communicating with the outside, to supply air for fire, another 2in. pipe above chimney-place, with one end open into room near ceiling, the other end at the bottom opening into chimney, immediately above mantelpiece, for the purpose of extracting the foul air.

RULE 7.—The roofs to be projected about 8in., with wooden or iron spouts. The baulks to be kept up 18in. above the level of walls, which must be beam filled.

RULE 8.—Windows, diamond panes, to be made with zinc frame let into wood, in four divisions, one upper one to open, hung on strong brass hinges, with iron handles to open and shut them.

RULE 9.—Floors of kitchen and scullery laid with tiles, cement, or brick well burnt—sleeping rooms or closets with wood, the joists kept clear of the ground, air being let in to prevent dry rot.

RULE 10.—Coal-shed and pig-stye, &c., to be erected at the back, some distance from dwelling-house.

ANOTHER SKETCH-BOOK.

SIR,—I was much pleased to see the above subject taken up by your last week's correspondent, Mr. Gibson, and I am happy to find that my appeal to the sketching members of our profession (and there are some who do not sketch) has not been disregarded, the subject, in this progressive age of ours, being one of special importance. I think your correspondent is perfectly right in regard to the drawings being to scale; in my opinion they would be useless if they were not scale drawings. I would also suggest that in every case the scale should be drawn on the sketch it applies to, as, unless this is done, it is obvious that through the process of photo.-lithography the drawing changes scale, while the written scale remains unaltered—confusion that might be easily avoided by drawing each scale.

There is another point which has often struck me as being much neglected now-a-days: examples of mouldings are drawn to such a small scale as to be almost useless, and frequently the studied contour, the deep undercut and ungraceful section, is cooked up to "look graceful" by being struck with compasses; in fact I could name a book of "authentic examples" in which almost all the rounds and hollows are similarly served up. This leads me to suggest that whenever section or plan of moulds is given it should be drawn to a much larger scale than the general detail it illustrates; and, indeed, I think all sections should be taken by the cymagraph, so as to ensure their faithful delineation. These full-size sections, in all cases, to be sent up with the scale drawings as a guarantee of a faithful reduction of the same.

With reference to the character of the sketches, I think we are all agreed that there should be no "mere sketching," and I would advise an exclusion of the already too-prevalent picture-making tendency, which I am happy to see is avoided by our best artists. I would suggest, also, that every line of unnecessary shading be omitted. No straining after effects allowed (effects pretty—very pretty—in their way, but often misleading, and always deceptive and false). By all means, let us have artistic drawings; but let them be line drawings—no lines omitted that would have brought out the point of the example illustrated, and none introduced (to gratify mere shading propensities) which could honestly be dispensed with. By this severe, honest manner of drawing I think we can ensure really useful, clear, and suggestive sketches. I need not refer to the many beautiful specimens which have been published recently; amongst others Mr. Godwin's perspectives. Eloquent evidence of what can be done with few lines provided each line is correct. I am sure we cannot do better than extend our limited range of study, which, I think, is too much in one groove—Ecclesiastical—the exclusive study of which seems to have built round us a wall, shutting out most excellent "ancient lights" of secular work. As to classification, no doubt we must have system, but by all means let it be a good one.

And in regard to setting apart a certain subject for a certain time, as proposed by Mr. Gibson, I do think this is objectionable, especially when we think how few of us (however industrious) can study examples of one period at one time. Experience shows the reverse of this order, as most tours result in a mixed study of various styles and periods. Therefore, I think we had better (for want of an amendment) revert to my first suggestion, viz., that when any sketches are ready for photo-lithography, they be sent to your office, there to be classified and arranged for publication. In conclusion, I think style and period should have preference to material. But the examples illustrated should be allowed to include specimens of the special treatment of every material used during that style or period.—I am, &c.

TREFOIL.

DANGEROUS STRUCTURES.

Sir,—I wish to call your attention to the want which has existed for years past, and which is likely to remain until some decided step is taken, of an official inspectorship of new buildings which are erected in these places to which the power of the Metropolitan Board of Works does not extend, and where, as most of the work is done for speculative purposes, the premises collapse, either during the time of erection or when finished, often with injury to the men employed, and sometimes even with great loss of life.

In this parish I have seen a pond of about 50ft. diameter, and 7ft. deep below water mark, filled up with cinder and other rubbish, the footings immediately laid on this unconsolidated mass, the carcases completed and sold at once for fear they should fall down; in another instance, the ends of the first-floor joists not only rested in the chimney-breast, but actually projected into the flue, and in a third, a 10ft. opening was left for a bay window; the bressummer to carry the brickwork for the first floor was 6in. by 3in., and to weaken this still more the ends of the joists were mortised through it.

There is only one way to remedy this sort of thing, and that is that an Act of Parliament should be passed, making it imperative that in all parishes outside the limits of the Board of Works there should be a local surveyor appointed to inspect all buildings during their erection, such surveyor being selected by the Metropolitan Board of Works, or by the parish authorities, and his salary paid by a small percentage on the value of the work charged to the proprietors.

This would be such an obvious improvement that it is a matter of surprise to many that such an Act as here briefly hinted at has not been passed before.—I am, &c.,

Walthamstow. E. T. B.

CONCRETE BUILDINGS.

Sir,—We are all greatly interested in cheap building and the economic use of concrete, but will some of your correspondents state the value of a concrete building as security (say) for ground rent, mortgage, &c. Suppose a property brought to the hammer, what would the auctioneer or buyers say to it? The stereotyped "substantial brick-built building" could not be urged to enhance the price. How much per cent. would it be under the value of a brick building of the worst description? I do not wish to undervalue concrete, but this phase of the matter must not be lost sight of by the architect.—I am, &c.,

Thos. Chas. Sorby.

27, Brunswick-square, W.C., Nov. 6.

HONESTY OF THE PROFESSION.

Sir,—It is an everyday occurrence for architects to complain loudly of the want of justice in the transactions of building committees and others with reference to competitions. In Mr. Godwin's recent controversy it was far from appearing evident that Mr. Holloway was in any way at fault. A certain number of premiums were offered to a limited number of competitors in recompense for their labours; it was, therefore, reasonable to expect that as many architects as there were premiums should be entitled to reward.

But the matter which I have more immediately in view has reference to the late competition for the Watford Public Library, in which the instructions issued clearly stated that all drawings were to be either etched in pen and ink or tinted in monochrome. Now, out of a dozen competitors only three or four complied with this stipulation, so that if the committee had dealt strictly, very few would have been held eligible. Some of the best designs were highly coloured, and that to which the second premium has been awarded was tinted in several distinct colours. This hardly speaks well for the integrity of the profession, and suggests the reflection that it would be well to inculcate the common principles of honesty among ourselves before proceeding to denounce others.—I am, &c.,

Watford, Nov. 4. W. H. Syme.

THE PRESENT POSITION OF ARCHITECTS' ASSISTANTS.

Sir,—The excellent suggestion of your correspondent, last week, that the present position of the architectural assistant should be discussed in your columns, with a view to its improvement, deserves to be followed at once. Few of us will deny that the difficulties in the way of any change for the better are very great, and the question is not only a difficult but a delicate one, for we shall wish carefully to avoid anything like trade-union mode of action, and, I fear, it must be admitted that we are, unfortunately to a great extent, at the mercy of our employers, and any concession we may gain will be obtained only by having fully convinced them of the fairness and justice of our claims. First, then, the architectural assistant is badly paid. As your correspondent points out, in many cases he receives actually less than an ordinary artisan, and perhaps he has to wait six weeks or three months for that, while the usual salary of a clerk of works is about three guineas per week, and many clerks in our large mercantile houses receive double that amount. Granting that architects themselves are, as a rule, insufficiently remunerated, they should remember that the advanced prices of nearly all the necessaries of life—to say nothing of its luxuries—affect us much more than they affect the artisan.

One very strong reason for the lowness of our remuneration lies in the fact that so large a number of assistants and would-be assistants are quite willing to work at merely nominal salaries, and so long as this is the case, we cannot expect that our employers will voluntarily increase our pay for the mere sake of doing common justice to those who cannot afford to give their work for nothing. It is to the "leading" architects that we must look to give us an improved position, but I believe that, as a rule, it is these who pay the lowest salaries.

The present length of the office hours is a serious inconvenience to those who wish to improve themselves by study. After working hard in the office (say) from 9 a.m. to 6 p.m., few have sufficiently strong constitutions to enable them to study for several hours, let alone the necessity for rest and relaxation. And here, I think, we shall again find that the "leading" architects are most at fault—certainly they work their assistants longer hours than most of those who, perforce, occupy a humbler position in the profession. There has been a great outcry for opportunities of study; classes have been started, and a considerable effort has been made in a good direction, but there has been a counter cry that when opportunities are offered students will not take advantage of them, and may not the reason be that the majority of students feel themselves so wearied by their day's work as to have no energy left for any further effort? I would suggest that our first efforts be directed towards shortening the office hours. There is no doubt that proportionately more work would be got through, and that our employers would not ultimately find themselves the losers, even if they had to employ more hands. The question is one of more importance than is usually acknowledged, and deserves to be very fully discussed, and it is to be hoped that the present opportunity will not be lost through the apathy of those most intimately concerned.—I am, &c., W. S.

Sir,—I am glad to at last see a letter in your valuable paper on the above subject, and trust that now the matter has been mooted the assistants will, as a body, co-operate for their mutual benefit. It must be borne in mind that large premiums are often paid to architects, and several years devoted by the pupil to the study of the profession before he is qualified to undertake the responsibilities of an assistant, and having reached that enviable position, his remuneration is sometimes far below the wages of the worst paid mechanic, and his wildest hopes, as an *employe* cannot aspire to a salary equal to one-half of that often enjoyed by mercantile clerks. The assistant is compelled to devote the whole of his means to as far as possible maintain an appearance which his position demands, and is debarred, in the majority of cases, from attaining that social station to which his profession entitles him; nor can he think of marrying. Does not the small percentage charged by the architect for his valuable services prevent his paying his assistant adequately, or is it that the apathy of the *employé* has caused on the part of the employer a feeling of indifference to his welfare? If this is the case it is time the assistants "wake up," and by an organised movement show the architects the value of their services, and the impossibility of their duties being performed by the uninitiated.—I am, &c.,

Another Protestant and Architect.

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New County Lunatic Asylum, Chartham, Kent.—The plans of Messrs. John Giles & Gough, 28, Craven-street, Strand, have been selected in a limited competition for this asylum, to accommodate upwards of 1,100 patients.

On All Saints' Day the parish church of Kidderminster was reopened by the Bishop of Worcester. The galleries have been removed and the organ placed in a suitable chamber on the north side of the choir. A handsome font of Caen stone and a pulpit of the same material have been placed in the church.

Intercommunication.

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QUESTIONS.

[2684.]—**House Property.**—I should feel obliged if any of your numerous readers could inform me of any good works that treat fully of the valuations of house property, including freehold, leasehold, copyhold, mortgages, &c., fully explaining same, and giving modes of calculating their different values.—Henry Halson.

[2685.]—**Parochial Rating.**—Can any of your readers point out any book that will give information as to the usual mode or basis for assessing the annual value of land, buildings, mines, railways, canals, gas and water works?—Young Surveyor.

[2686.]—**Mounting Plans.**—Will any one kindly explain a good method of mounting plans drawn on tracing cloth; also, the best substance to mount them upon?—Subscriber.

[2687.]—**Water in Cellars.**—I shall be much obliged to be informed, through "Intercommunication," if there is any way of getting rid of water in a cellar where there is no sewer near, nor yet any other place into which we can drain. I have had a dumb well sunk, intending to drain into it, but this I find fills up with water immediately, and so is of no avail. We have at present a small well sunk in one corner of cellar, and the water is pumped up, but this is not only a great nuisance, but also a constant expense.—James Smith.

[2688.]—**Drainage.**—I have a main drain laid with 6in. pipes from a field of several acres to a stream 200 yards distant, the total fall being 18in. only. The inlet I find is about a foot below the surface of the water, and the pipe at the outlet is running about one-eighth full. Would a well with iron grating built about midway in the length of the drain assist the flow of water? Any information would be gladly received, as I do not wish to take up the pipes to insert larger.—R. H. W.

[2689.]—**Fountain Opposite Bethlehem Hospital.**—Will some one inform me who is the architect of this fountain?—J. M.

[2690.]—**Erection of Workhouses.**—Could you kindly inform me, or could any of your correspondents, through the medium of your excellent paper, inform me how, or where, I could get information as to the requirements of the Local Government Board in the erection of workhouses?—E. M. R.

REPLIES.

[2675.]—**Books, &c., for Articled Pupils.**—I am glad to see the question in your last week's issue as to course of study to be recommended for architects' pupils, and would be more so if it were answered by any of our successful and eminent architects. I am sure it would have a more beneficial effect upon architecture than all the twaddle in the shape of criticism, especially to a—Country Pupil.

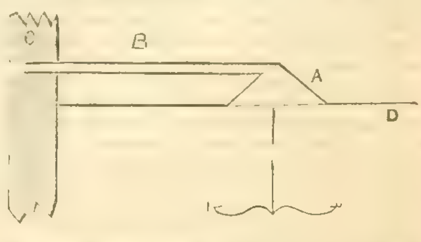
[2681.]—**Buff or Yellow Bricks.**—We beg to say we can supply your inquirer with a pale primrose-coloured brick or a good cheap yellow malm.—Doulton & Co.

[2681.]—**Buff or Yellow Bricks.**—There are plenty of buff bricks to be had in each of the counties you name, but their cost must be regulated by the distance they have to travel by rail, or otherwise.—A. B.

[2681.]—**Buff or Yellow Bricks.**—In reply to "C.," I beg to state buff bricks of best and seconds quality are made in Suffolk. Apply to the Ballingdon Brick Works, near Sudbury.—B. D.

[2682.]—**Damp and Sea Salt in Party Walls.**—Your correspondent "E. L. G." asks if there is no preparation that will prevent the absorption of salt and water into new stone if applied internally. The only effectual preparation I have found for the prevention of damp, and for the preservation of the stone or plaster, is a petrifying liquid manufactured from silica by the Silicate Paint Company. It has the property of closing effectually the pores of the stone, plaster, cement, &c., and no amount of moisture appears to affect it afterwards.—An Estate Agent.

[2683.]—**Carrying off Hot Air from Rooms.**—I lately solved the problem of carrying off the hot air independent of smoke flue by placing a square inverted basin between the joists right above the gaselier, and boring small holes between the leaves of centre flower, so as to allow the air to pass up through ceiling into basin. From the basin I carried a pipe, say 1in × 3in., to outside wall, and put on a small grating in front. The mouth of zinc, or tinned iron basin, would measure about 1ft. 6in across. I append sketch if thought worth while to give, A being basin, B pipe, C outer wall, D ceiling of room.—Plumber.



Our Office Table.

BUILDING ACTIVITY IN CHICAGO. — Chicago claims to have been rebuilding itself during the past eight months at the rate of one fourth-story edifice for every hour of the working day. Assuming that it would require an average force of at least twenty men to complete one such building in eight months, and counting eight hours as a day's work, this computation would imply that 33,600 mechanics are steadily employed in the actual raising of houses in Chicago, to say nothing of the numerous auxiliary handicraftsmen whose home labour contributes to the finishing and ornamentation of each structure. These latter being, at the lowest estimate, as many as the builders proper, it follows that nearly one-fourth of the entire population of Chicago, men, women, and children, is engaged in the manual toil of house-building.

ARTESIAN WELLS AT CHICAGO.—Artesian wells are multiplying in Chicago, 21 of them having already been bored, and in no instance has a failure to obtain a plentiful supply of water occurred. The well at Kenwood, just south of Chicago, 1,255ft. deep, and 5½in. diameter at the bottom, yields 650 gallons per minute. It cost about 6,000 dollars. Another well, in the business centre of Chicago, is 1,600ft. deep, yields 525 gallons per minute, and cost 7,000 dollars. The usual depth of the wells is from 1,200ft. to 1,300ft., and the average cost is 6,000 dollars for a 5½in. well 1,200ft. deep, and 5,000 dollars for a 4½in. bore to the same depth. The surface pressure of the water varies from 22lb. to 35lb. to the square inch, and the latter pressure is sufficient to throw a stream to the height of 100ft. The deepest well in Chicago is in the South Park, where the bore, 3½in. in diameter, has been carried down 1,640ft. The comparative smallness of the flow from this well is adduced as an argument in favour of larger borings.

LONDON ASSOCIATION OF FOREMEN ENGINEERS AND DRAUGHTSMEN. The large meeting room of this society, at the City Terminus Hotel, Cannon-street, was crowded on Saturday night, by members and their friends anxious to hear a paper which had been announced to be read by Mr. Thomas Webster, Q.C., F.R.S., "On the Promotion of Practical Science and Technical Education, by Museums of Inventions, established and maintained by the Surplus of the Inventors' Fee Fund." Mr. Joseph Newton, C.E. (of the Royal Mint), presided, and the vice-chair was occupied by Mr. Irvine. The paper was received with marked attention, and its reading was followed by a most interesting and animated discussion, in which Mr. Benjamin Fothergill, C.E., Mr. A. V. Newton, Mr. Hedley and others took part; after which the following resolution, proposed by Mr. W. Lloyd Wise; A.I.C.E., M.I.M.E., and seconded by Mr. D. Campbell, was put to the meeting, and carried by acclamation, "That this meeting considers the Patent Office Museum at South Kensington totally inadequate to the requirements of the age, and is of opinion that after suitable provision has been made for the efficiency of the Patent Office, a reasonable proportion of the surplus funds arising from the granting of patents for inventions should be devoted to the establishment and maintenance of a more comprehensive Museum of Inventions, for the advancement of practical science and technical education." Mr. Gibbon then proposed, and Mr. Campbell seconded, "That memorials in furtherance of the foregoing resolution be presented and supported by deputations to the Prime Minister and the Lord Chancellor;" which having been carried unanimously, the meeting was closed with a vote of thanks to Mr. Webster for his able paper.

PROPOSED RIVER BATHS AT CHELSEA.—Captain Roberts, C.E., has informed the Chelsea Vestry of his application to the Metropolitan Board for a concession of the foreshore within the area required for the Chelsea Embankment as a site for public baths. He also asked for the moral support of the Vestry, and an assurance that no assessment shall be made upon the property or building. Plans of the proposed baths and wash-houses were laid before the Vestry, from which it appeared that these baths and wash-houses would not interfere with the subway or the outfall sewer. The money was ready for the undertaking, and if the sanction of the Metropolitan Board were obtained, Mr. Webster would do the work. The Vestry took no action at present, it being pointed out that the Vestry could not interfere as regarded the assessment.

NEW YORK CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.—At the sixth annual meeting —and first regular business meeting —of this Chapter for the current official year, 1872-3, the following officers and Standing Committees were elected: President, James Renwick; Vice-President, R. G. Hatfield; Treasurer, Henry Fernbach; Secretary and Librarian, A. J. Bloor. Executive Committee—James Renwick, Chairman, Henry Fernbach, A. J. Bloor, R. G. Hatfield, Carl Pfeiffer, N. le Brun. Committee on Admissions—H. Hudson Holly, R. M. Upjohn, Wm. T. Hallett, Geo. B. Post, James Renwick, ex officio. Committee on Library and Publications—R. M. Hunt, C. C. Haight, Chas. D. Gambrill, A. J. Bloor, James Renwick, ex officio. Committee on Education—E. T. Littell, Alfred H. Thorp, James Renwick, ex officio. Committee on Examinations—R. G. Hatfield, Henry Dudley, John W. Ritch, A. J. Bloor, James Renwick, ex officio. The Committee on Examinations are the appointees of the Chapter, under Act passed by the Legislature of the State of New York, April 20th, 1871, entitled an "Act to amend and reduce to one Act the several Acts relating to buildings in the city of New York." Sections 37 and 42. The Library of the Chapter is open to all practitioners and students of architecture and the cognate arts.

PAPERS TO BE READ AT THE INSTITUTE.—The following papers have been promised, and will be read as under, subject to such alteration in regard to date as circumstances may require: "On Professional Esprit de Corps," by T. Roger Smith, Fellow, Monday, November 18th; "On Arbitrations," by B. Fletcher, Associate, Monday, November 2nd; "Notes on the Architecture of Chester," by C. H. Heathcote, Associate, Monday, December 16th; "On the Valuation of House Property in London," by E. I'Anson, Fellow, Monday, January 6th, 1873; "On S. Peter's Orphanage and other Buildings in the Isle of Thanet," by J. P. Seddon, Fellow, Monday, Junuary 20th; "On the Principle of Sub-Ordination in Design," by H. H. Statham, Associate, Monday, February 3rd; "On the Mediæval Brickwork of Pomerania and Mecklenburg," by J. Tavenor Perry, Associate, Monday, February 17th; "On the Old Hall at Gainsborough, near Lincoln," by C. Hadfield, Fellow, Monday, March 17th; "On the Laying Out of Cities," by J. B. Waring, Fellow, Monday, March 31st. Further announcements will be made in due course.

ARCHÆOLOGICAL INSTITUTE.—The first meeting for the season of the Archæological Institute took place on Friday last. Mr. Earwaker's paper on the swords which bear the name "Edwardus prins Angliæ" was interesting. It appears that the existence of seven such swords has been recorded, five of them in the north of England. Two, now lost, and one, now in the possession of the Rev. F. Harford, at Westminster, have been exhibited to the Society of Antiquaries, in 1764, 1781, and 1858 respectively. Several examples were quoted by Mr. Earwaker of the presentation of swords or "falchions" as services in the tenure of land under the Bishops of Carlisle and Durham. It was further decided that the swords exhibited and those also of which Mr. Earwaker had made drawings were for use in "forestry" or the chase; that they were of foreign make, probably German, and that they did not date earlier than the reign of Edward VI. No light was thrown on any of the questions connected with the sword of the Black Prince missing from Canterbury, except that none of these "falchions" can be any longer called his. The meaning of the inscription—"Edwardus prins Angliæ" was not much elucidated, but the fact was established that no English prince ever bore such a title. The meeting was unusually prolonged, and many matters were left untouched for the December meeting.

ARCHÆOLOGICAL DISCOVERY IN YORKSHIRE.—Last week five stone coffins were discovered by the workmen engaged in excavating in connection with the formation of the new railway station in the outskirts of York. Four of the coffins are about 6ft. in length, but the other is of smaller size, and it has evidently contained the remains of a female. They were discovered, on an average, about 5ft. below the surface of the ground, and near together. They were roughly hewn, with the exception of one, which had evidently been prepared for an inscription, and they all contained human remains, the skeletons being in very good preservation.

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MEETINGS FOR THE ENSUING WEEK.

MONDAY.—INSTITUTION OF SURVEYORS.—Opening Address by the President, Mr. E. H. Clifton. 8 p.m.

TUESDAY.—THE INSTITUTION OF CIVIL ENGINEERS. —Discussion upon Mr. Abel's paper on "Explosive Agents Applied to Industrial Purposes." 8 p.m.

FRIDAY.—ARCHITECTURAL ASSOCIATION.—Introductory Lecture to a course of six on "Professional Practice." By Mr. T. Roger Smith, F.R.I.B.A. 7.30.

Trade News.

WAGES MOVEMENT.

BELFAST.—Building operations are suspended in Belfast in consequence of a strike, the men refusing to be paid by the hour instead of receiving a fixed sum per week, as at present.

BRISTOL.—A meeting of the builders' labourers of Bristol was held on Monday night The secretary of the Operative Plasterers' Association addressed the meeting. He stated that in Bristol they were very much under-paid. In the north the labourers were paid £1 6s. or £1 7s. a week, whilst in Bristol they only received 17s. or 18s. for more arduous work and longer hours. In this state of affairs the committee of the labourers' society thought it right to lay the matter before the great mass of the labourers of the city in order to induce them to become combined. But ere they would make any public agitation for a general advance of wages in the spring of 1873, they must get a representative body of the labourers, because they could not make any demand on their employers whilst they were in a minority. The wages in Bristol were lower than in any other town in England. In Plymouth and Exeter the rate was £1 1s. 6d. per week, in Birmingham it was 50 per cent. higher than in Bristol; and in nearly all large towns the wages were 10s., 12s., or 14s. a week more than here. Yet the price of provisions was, in some instances, higher in Bristol than in these towns, and, in many cases, the labourers did not actually receive enough for their daily sustenance. In conclusion, the speaker urged on the labourers of Bristol to organise.

GREENOCK.—The plumbers, gasfitters, and brass-finishers of Greenock have commenced to work on the 51 hours per week system.

LIVERPOOL.—The house carpenters and joiners of Liverpool and Birkenhead have sent to their employers a request for an increase of 2s. 4d. per week in their wages, a reduction of five hours per week in their working time, and several alterations in their working rules.

WISHAW.—Though the strike of the Wishaw quarriers may be said to be finished, there is comparatively little doing. Before the dispute there were about 200 employed, but, as yet, not a third of that number are at work. Building in the district is, moreover, quite at a standstill.

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TENDERS.

ASHFORD. — For fittings to West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—

Oliver	£1995
Kirk	1963
Richardson	1595
Merritt & Ashby	1524
Sale	1457
Moreland & Nixon (accepted)	1429

BROMLEY, E.—For additional infants' school to schools in Mary-street, for the School Board for London. Mr. Lacy W. Ridge, architect. Quantities supplied by Mr. Riddett:—

Nightingale (accepted)	£894

CAMDEN TOWN.—For the erection of Nos. 91, 93, and 95, High-street, Camden Town. Mr. J. Waghorn, Architect.

Mann	£3275
Kelly Brothers	3270
Hyde	3120
Scrivener & White	2985
Manley & Rogers	2983

HATCHAM.—For the erection of schools in Kender-street, Hatcham, for the London School Board. Messrs. J. Gale & J. P. Manning, architects. Quantities by Mr. D. J. Brown:—

Nightingale	£8955
Axford & Co.	8525
Sheffield	8481
Browne & Robinson	8190
Brass	8150
Scrivener & White	8150
Crockett	8130
Higgs	7963
Cooke & Green	7865
Nixon	7636
Cooper	7634
Carter	7595
Mann	7494
King & Son	7335
Shepherd	6750

HERTS.—For taking down the chimney shaft at the S. Pancras Industrial Schools, Leavesden, Woodside, Herts; and for building a new shaft for the S. Pancras Guardians. Messrs. Richardson & Waghorn, Surveyors.

	£	For alternative design. £
Kelly Brothers	633	600
Chalk	495	414
Wall	480	470
Shurmur	444	392
Waterman	420	370

LEICESTER.—The tender of Mr. F. Whitfield, Birmingham, has been accepted for the whole of the fireproof doors and fastenings of the bullion and security rooms in the new buildings of the Leicestershire Banking Company at Leicester. The same firm has just completed a contract for a number of fireproof doors and shutters for the accountants' offices and board room in the new buildings of the Midland Railway Company at Derby.

LONDON.—For reinstating premises, Tottenham-court road. Mr. H. H. Collins, architect:—

Merritt & Ashby	£187
Cohen (accepted)	167

LONDON.—For the erection of schools in Harper-street, London. Mr. R. W. Edis, architect. Quantities by Messrs. Goodman & Pinall:—

Conder	£8960
Perry Brothers	8720
Hill & Sons	8193
Wicks & Bang	7996
Sewell & Sons	7955
Ashby & Sons	7790
Adamson & Son	7771
Dove Brothers	7725
Wood	7685
Bull & Sons	7646
Coleman	7537
King & Son	7440
Shepherd	7400
Newman & Mann	7325
Mersland & Son	7244
Roberts	6996

RENHOLD.—For the erection of a chapel. Mr. F. P. Mercer, architect, Bedford:—

Haynes	£331	4	0
Corby & Son	301	6	0
Smith	294	0	0
Richards, sen.	293	4	0
Knight & Boston	287	0	0
Wootton	283	17	6
Steers	282	0	0
Carter	280	10	6

LONDON.—For warehouse, S. Mary Axe. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batston & Hunt:—

Moreland & Co.	£3417
Henshaw	2734
Newman & Mann	2656
Oliver	2620
Merritt & Ashby	2595
Kirk (accepted)	2496

LONDON.—For alterations and building works at 94, Regent-street. Mr. H. H. Collins, architect:—

Merritt & Ashby	£841
Cohen	835
Colls (accepted)	822

LONDON.—For making roads, West London District Schools, Ashford, Middlesex. Mr. H. Collins, architect:—

Jones	£887	14	6
Brooks	882	0	0
Hetton	756	0	0
Kirk	717	0	0
King	700	0	0
Batch	694	0	0
Cole	613	0	0
Nicholson (accepted)	575	0	0

LONDON.—For school and chapel fittings, West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—

Edwards	£747	10
Troughton	663	0
Seaton	666	0
Sidebotham & Co. (accepted)	562	0
Turner	519	0

LONDON.—For gas fittings, West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—

Strode & Co.	£577
Comyn, Ching, & Co.	528
May & Co.	515
Faraday (accepted)	455
Hedge & Co.	441

SOUTHBOROUGH (Kent).—For sewerage works. Mr. William Henry Wright, engineer. Quantities supplied:—

Ritson	£4867	5	6
Kershaw	4713	17	0
Pollard & Goldsmith	4575	0	0
Symonds	4375	0	0
Marshall	4200	0	0
Punnett & Son	3795	9	9
Blackmore & Howard (accepted)	3091	0	0

STAMFORD.—For the erection of a new brewery and additional tun room for Messrs. Melbourne. Mr. Geo. Scamell, 18, Great George-street, Westminster, architect. Quantities supplied by Messrs. Curtis & Son:—

Pattinson	£1985	14	5
Brown	1980	0	0
Richardson	1898	0	0
Halliday	1815	0	0
[illegible]	1798	0	0

STEPNEY.—For the erection of schools in Gloucester-street, Stepney, for the School Board. Messrs. Lee Brothers & Pain, architects. Quantities by Mr. W. Pain:—

Cook	£13550
Marsland & Sons	13400
Myers	13269
Nixon & Son	12160
Coleman	12147
Brass	12134
Higgs	11977
Sewell & Son	[illegible]
Bayes & Ramage	11150
Wicks & Bangs	10981
Wood	10973
High	[illegible]
Sheffield	[illegible]
Ashby & Son	[illegible]
King & Son	10540
Thorn & Co.	10190
Conder	[illegible]
Foster	10086
Ennor	10042
Hill & Son	[illegible]
Newman & Mann	9976
Nightingale	9963
Shepherd	[illegible]
Cooke & Green	[illegible]
Perry Brothers	9800
Roberts	[illegible]

WEST HARTLEPOOL.—For the erection of a Friends' meeting-house at West Hartlepool. Messrs. Alexander & Henman, architects:—

Porden & Glass (accepted)	£636	5	0

WIMBLEDON.—For building ten cottages, for Mr. Thomas Lyon. Mr. J. [illegible], architect:—

West (accepted)	£1859

WHITECHAPEL.—For proposed new elementary schools in Old Castle-street, Whitechapel, for the London School Board. Mr. Edward Bíven, architect. Quantities supplied by Mr Thomas Nixon:—

Gammon & Sons	£10910
Shepherd	10310
Wood	10183
Hill & Sons	10104
J. & F. Coleman	9688
Ennor	9650
Sewell & Son	9622
Oliver	9583
Wicks, Bangs, & Co.	9550
Ashby & Sons	9550
Dove Brothers	9475
Henshaw & Co	9390
Newman & Mann	9341
Conder	9173
King & Son	9173
Foster	8998
High	8995
L. H. & R. Roberts	8989
Perry Brothers	8977

WHITECHAPEL.—For alterations, &c., to premises in Berner-street, Whitechapel; for new schools for the School Board for London. Mr. E. R. Robson, Architect to the Board. Quantities by Mr. W. H. Barber.

Kirk	£1594
Newman & Mann	1565
Kilby	1563
Riddell	1540
Jerrard	1484
Johnson	1420
Perry & Co.	1394
Ennor	1375

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COMPETITIONS OPEN.

BUNTINGFORD, November 12.—For a scheme for draining the town, in accordance with the River Lea Conservancy Act, 1868.—Mr. J. Hunt, Clerk to the Guardians, Union House, Buntingford.

CARLISLE PUBLIC HALL COMPANY, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

CHESTER UNION, February 1, 1873. For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

CHICHESTER, November 27.—For plans and specifications for the conversion and reconstruction of the West Sussex Company's premises in East-street into a club house.—Mr. E. G. Raper, Secretary, West-street, Chichester.

LEYBURN UNION, November 14.—For plans and specifications for a new workhouse, to be erected at a cost not exceeding £3,000. A premium of £50 will be given for the plans and specification chosen.—Mr. R. Chapman, Clerk to the Guardians, Leyburn, *via* Bedale.

LLANELLY SCHOOL BOARD, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £4 per head. A premium of £15 will be paid for the plan approved of. Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

THE CARLISLE DIOCESAN CHURCH EXTENSION SOCIETY, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ADMIRALTY (Whitehall), November 26.—For supplying H. M. Dockyards with chain for rigging, cranes, &c.—Mr. F. W. Rowsell, Superintendent of Contracts.

ARMY CONTRACTS, November 12.—For the supply of 50,000 yards of cotton rope.—Mr. T. Howell, Director of Contracts, War Office, 5, New-street, Spring Gardens, S.W.

BEDFORD, November 11.—For the formation, kerbing, flagging, channelling, &c., of Priory-street.—Mr. T. W. Pearse, Clerk to Local Board, Bedford.

BELFAST, November 20.—For the construction of about 23,540ft. of brick sewers, with street gulleys, sewer entrances, ventilating shafts, &c.—Mr. J. Guthrie, Town Clerk, Town Hall, Belfast.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BRADFORD, ECCLESHILL, AND IDLE, AND IDLE AND SHIPLEY RAILWAYS (Second Contract).—For the construction of passenger stations, platforms, waiting sheds, &c., at Eccleshill and Idle. And goods shed, coke stage, engine pits, crane, weighbridges, and other works at Shipley.—Mr. J. Fraser, Engineer, 19, York-place, Leeds.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

CANTERBURY, December 2.—For a concession of the town sewage.—Mr. R. W. Flint, Town Clerk, Castle-street, Canterbury.

CHELSEA, November 12.—For the construction of 1,459ft. of 3ft. 9in. by 2ft. 6in. brick sewer, with gulleys, pipe-drains, &c.—Mr. C. Lahee, Vestry Clerk, Vestry Hall, King's-road, Chelsea, S.W.

ECCLESHILL, November 18.—For the erection of a detached house.—Mr. S. Firth, Architect, Undercliffe.

GREAT WESTERN RAILWAY, November 12.—For the construction of stables at Hockley, near Birmingham.—Mr. F. G. Saunders, Secretary, Paddington Station, London.

GREAT NORTHERN RAILWAY (First Contract), Osset and Dewsbury Railway, December 9.—For the construction of passenger station, platforms, waiting shed, and goods warehouse, at Earlsheaton, and large fireproof goods warehouse, offices, entrance gates, and weighbridges, cottages, &c., at Dewsbury.

INDIA OFFICE, November 11.—For the supply of carriage-traversers for Indian State railways.—Mr. G. C. Talbot, Director-General, India Office.

KEIGHLEY, November 16.—For sewering, levelling, paving, flagging, and channelling of Croft, West Leeds, Sandywood, and Lund streets, and Becks-road.—Mr. H. Alty. C.E., Engineer to Local Board, Keighley.

LEEDS, November 11.—For the construction of a bridge over Sheepscar Beck, for the extension of Regent-street to Quarry-hill.—Mr. A. M. Fowler, C.E., Borough Engineer, Town Hall, Leeds.

LEOMINSTER, November 21.—For the erection of class-rooms for the National Schools.—Mr. E. Lloyd, Solicitor, Leominster.

METROPOLITAN BOARD OF WORKS, November 21.—For the construction of 908ft. of brick sewers, with iron pipe, and other works in connection therewith.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens.

MIDLAND RAILWAY, November 19.—For the erection of machine office and weighbridge foundations at South Tottenham.—Secretary, Way and Works Committee, Midland Railway, Derby.

MIDLAND RAILWAY, November 18.—For the supply of chains, iron, copper, brass, tin, and various other stores.—Mr. J. Williams, Secretary, Derby.

MORECOMBE, November 21.—For the construction of 1,000 lineal yards of brick sewers.—Mr. John Bond, Surveyor, Morecombe.

MORLEY LOCAL BOARD, November 14.—For paving, flagging, and kerbing Upper Fountain-street, New-street, and Cross-street.—Mr. J. Rayner, Clerk to the Board, Queen-street, Morley.

NORTH LONDON RAILWAY COMPANY, December 3.—For the supply of 300 tons of house coal.—Mr. R. S. Mansel, Secretary, Euston Station, N.W.

PUDSEY CEMETERY, November 11.—For the erection of two chapels, with mortuaries and vestries attached, and registrar's house.—Mr W. Gay, Architect, 10, Exchange-buildings, Bradford.

S. MARY ABBOTT'S (Kensington), November 13.—For the construction of about 2,427ft. of 3ft. 9in. by 2ft. 6in. brick sewer, with air-shafts, side entrances, &c.—Mr. G. C. Harding, Clerk to the Vestry, Vestry Hall, Kensington.

S. MARY (Lambeth), November 11.—For the purchase of two lamps and pedestals now standing at the gates of Lambeth Church.—Mr. T. Morris, Clerk to the Burial Board, Vestry Hall, Kennington-green.

SOUTHPORT, December 3.—For the erection of a new public building in Lord-street.—Messrs. Maxwell & Tuke, Architects, Bury.

TOTTENHAM, November 12.—For road sand and scrapings.—Mr. E. Crowne, Clerk to the Local Board of Health, Tottenham.

WAR DEPARTMENT CONTRACTS (Portsmouth District), November 13.—For the execution of bricklayers', masons', paviors', carpenters', plasterers', slaters', plumbers', smiths', ironfounders', painters', glaziers', paperhangers', and gas fitters' work, and the supply of ironmongery articles to Christchurch Barracks.—Col. P. Burnaby, Royal Engineer Office, Portsmouth.

WAR DEPARTMENT CONTRACTS, November 23.—For the performance of works and repairs to War

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 15, 1872.

CHICAGO REDIVIVUS.

"IN all past time the hand of man has not done so much in so short a period" is the boast of one of the writers of a voluminous report received from Chicago, giving a year's history of the Lake city, and published on the 9th October, the anniversary of the memorable fire which reduced 20,000 of its houses to ashes. After reading this remarkable and deeply interesting, not to say instructive, report, one does not feel inclined to grudge the writer his boast. Certainly, the wonderful activity of the Chicagoans, their energy and enterprise, like the fire and its incidents, can hardly be exaggerated. Never before has the world seen, and probably not again in ages will it see, such a marvel of growth as the new Chicago can point to. Before, however, noticing some of the more remarkable results achieved in rebuilding during the past twelve months, let us glance very briefly at the amount of property destroyed, of which we have had until now only an approximate estimate. In 1871 Chicago was a city with a population of 334,270, divided among 50,500 buildings, and covering an area of 30,000 acres. The fire destroyed 80 business blocks, 100 business buildings not in blocks, 1,600 other buildings chiefly residences, 32 hotels, 47 churches and religious establishments, 9 newspaper offices, 10 theatres and halls, 10 school buildings, 5 grain elevators, all the public libraries, 8 bridges, and three railway depots. Many of these, as our readers know, were imposing marble structures, such as are only to be found on the American continent. Scarcely less than 100,000 persons were rendered homeless by the conflagration, and the total value of the property (public and private) consumed is put down at 192,000,000 dollars. All history cannot furnish more than two instances where fire has played such wholesale havoc as this. The Great Fire of London lasted four days, destroying 13,000 houses (as compared with 20,000 burnt in Chicago in one night), besides 89 churches and many public buildings; 400 streets were laid waste, and 200,000 persons rendered houseless and destitute. In order to prevent the French army from occupying Moscow as their winter quarters, the Russian Government, in 1812, ordered the inhabitants to set fire to it. With such good will and despatch did they obey the mandate that more than two-thirds of their venerated city was soon a heap of ashes. The origin of the conflagration in the Lake city, like that of London, was accidental, and in both cases, unfortunately, it received its impetus from the same cause—wooden structures. There was less excuse, however, for the people of 1871 than for those of 1666. Chicago had her superb edifices, masses of marble and brick, and stone, and iron; but she had far more wooden rookeries and decayed shanties cheek-by-jowl with them. The city was, and is, the great lumber market of the world. Lumber was cheaper than brick or stone, was more easily procured, and more rapidly handled. In a city where time was everything, and durability was not a matter much considered, street after street was lined with timber erections, not even with oaken beams and floorings, but an aggregation of flimsily-constructed and inflammable pine. It was a city of experiments, where the first essays were made with the cheapest material, and all things were tried first with wood. Cheap things generally prove the dearest in the long run. Even the grander edifices which adorned the chief thoroughfares were in many instances a delusion and a snare. Wooden roofs, or roofs covered with compositions of which tar was a component part, stood ready to burst into flames with the first firebrand that fell upon them. Immense wooden cornices projected from their fronts. Iron shutters rarely guarded upper windows, and when they did they were apt to be fitted into wooden window frames. Inside, they were generally but vast shells of brick embracing thousands of feet of lath and planking. The beams were fitted into holes cut in the party walls, and as they burned through and fell, they dragged the walls down with them, and the flames spread into the adjoining buildings as a matter of course. Any city built like Chicago must, in time, have its great conflagration, and there are not a few young, yet populous, American cities similarly constructed. When it is added that the place, though situated on the margin of a vast lake—Lake Michigan—and having a river running through its streets, had a negligent and worn-out fire department, we can hardly marvel at its fate.

It is satisfactory to know that the terrible lesson has not been thrown away on the Chicagoans. The new Chicago has been built not for the present but for the future. The total number of buildings erected during the year the authorities have some difficulty in estimating accurately, but the following summary is pretty near the mark:—Since October last year there have been built 3 eight-story stone front buildings, 1 seven-story, 7 six-story, 42 five-story, 98 four-story, 23 three-story; 46 five-story brick, 142 four-story, 164 three-story, 6 five-story iron, 3 four-story, and 6 five-story cement, total 538. But many of these structures cover *nearly half a square*, and to arrive at a correct notion of the magnitude of the work done we must measure the frontage, which we find to be about 52,000ft., or nearly eight miles of solidly standing buildings, costing something like 40,135,000 dollars. There are scores of temporary erections not included in this list. During the year there have been laid altogether 67½ miles of side walk of wood in widths from 4ft. to 18ft. feet, and of stone and concrete. Of this 20¼ miles were laid on the south side, 25¾ miles on the north side, and 31½ miles on the west side, which suffered most from the ravages of the fire. This amount has all been laid down at the expense of the property owners. It was naturally supposed, after the catastrophe, that the wooden pavement must have been a chief agent in the rapid spreading of the fire, and it has been understood that it was so. The question is one of general interest to all who wish a durable and quiet pavement, and the testimony from Chicago is that it is very doubtful if a stone pavement "would have stood the siege better." The block pavement remained in good order, excepting in places where it had been injured, but by no means destroyed, by the showers of brands and cinders and avalanches of red-hot bricks which fell upon it, while the heaviest of stone side walks were calcined and ruined. Eight bridges, as we have said, were destroyed—namely, on Adams-street, Van Buren-street, Polk-street, Rush-street, State-street, Clock-street, Wells-street, and Chicago-avenue. The following is the Corporation's expenditure for reconstruction:—

	Dollars.
Temporary City Hall	75,000 00
Public Library and Reading Room	15,000 00
Pearson-street School Building	26,834 00
Franklin School Building	31,960 00
Ogden School Building	26,834 00
Bridges	250,332 12
Engine-house and engines	47 000 00
Machine shops and machinery	15,132 81
Reservoirs and hydrants	13,241 14
	529,468 07

We come now to the building materials, of which some interesting details are given. The increased use of stone in the architecture of the city is, from an artistic point of view, to say nothing of security, the great improvement occasioned by the fire. Many different kinds of stone have been used, several different styles adopted, and, as our American friends think, a charming variety has been the result. Modern Gothic and Italian, however, seem to find most favour among them. Previous to the fire, the stone ordinarily made use of in the larger buildings was a white limestone known as Athens marble, found in large quantities in Illinois. It is a fresh looking and pleasing stone, capable of almost any treatment, and shows incised work to better advantage than dark sandstones. But the effect of the flames on the limestones generally was very disastrous. It calcined them altogether, so that when they cooled it seemed as though they had actually burned like wood. "Indeed, next to granite, limestone possesses less power of resistance to high temperatures, such as that of this day last year, than any stone but granite. It carries the elements of it own destruction with it, and therefore has been fated to fade from the high position it once occupied as a building material." Nevertheless, the Athens marble has been employed to a considerable extent in the rebuilding. A favourite material is Buena Vista freestone, which is found near that place on the Ohio river. The stone is found in layers or ledges, only one of which, "the building ledge," as it is called, being considered fit for use in fine building. This ledge is generally about 40in. thick, and is found on an iron bed. The ledge, when cleared of the clay deposit, is reduced to about 3ft. of good solid clear stone. During the last three years, a large quantity of it has been used in New York and Boston, and its introduction as a building material has been followed by its immediate adoption. Its rich pleasing colour and durability have combined to make it a favourite, and, by a Government test, it has been found almost equal in strength to the strongest granite. Already more than half a million dollars' worth of this stone has been used in Chicago, exclusive of the Government building, which will take a million dollars' worth of the rough material. An olive-tinted sandstone from Amherst quarry, near Cleveland, Ohio, has also been very extensively used. It is easily cut, but inclines to stratification, the effect of which peculiarity on columns is described as being very singular, and the reverse of desirable. It is sold in Chicago at about 95 cents per foot. Several fine structures have been built of a light soft blue stone from Kankakee, Illinois, but its uniformity is marred to a great extent by traces of iron profusely scattered over it. Lake Superior sandstone is likewise in demand. It is somewhat sombre and grave in appearance—it is a dark brown, in fact—but is found to be effective in heavy buildings. Needless to say, there has been a surprising increase in the manufacture of brick. The number of bricks used in the city is said to be more than 400,000,000. They cost 4,100,000 dols., as against 97,000,000 in 1870, costing 750,000 dols. The bricks are made from clay dug out to form a new series of dock slips, and is believed to have no superior in the United States for making cohesive brick. However, it contains enough lime to make it objectionable to many for outside work on good buildings, so that much of the facing material comes from other parts. Then, again, the manufacture of quicklime has increased in equal proportion. The consumption during the twelve months was about 1,100,000 barrels, costing 990,000 dols. More than half of this was made in Chicago. The production in 1870 was 360,000 barrels, costing 290,000 dols. Six new kilns have been built since the fire; and the supply from without is so liberal that prices have advanced only 12 per cent., while bricks have advanced 25 per cent., and lumber fully 20 per cent. Missouri, Ohio, and Indiana, have joined to supply the enhanced demand. Nor need it be stated that the lumber and planing-mill business—Chicago has always been noted for her planing mills—has been particularly active to supply the enormous demand made upon their resources by the rebuilders of the city. The fire destroyed 19 mills, including one-half the productive capacity of the place; but that void has been filled fully twice over, especially by small establishments that have sprung up all round in machine shops, utilising the surplus power of the steam engines placed there to drive other machinery. The product of the year is about 14,600,000 dols., which is an increase of 50 per cent. over 1870.

The following are a few of the more noteworthy buildings erected, or in course of erection, with their dimensions and style of architecture :—New Government Building, for the accommodation of the Custom House, Post Office, Inland Revenue, Law Courts, &c. It measures 243ft. by 211ft., having in its centre a courtyard 83ft. by 198ft., roofed over with glass at a level with the second story. First story, 31ft. in height; second, 23ft.; third, 25ft. Height of building to attic cornice, 90ft.; to top of grand towers on the flanks, 177ft. Style, Florentine-Romanesque, harmoniously and elaborately treated. Will be four years in building. Chamber of Commerce is 93ft. by 100ft.; height of building to top of balustrade, 97ft.; four stories; height of board-room, 45ft. Constructed of Buena Vista freestone; cost, 320,000 dols. Railway Depot: Length of entire building, 610ft.; the track portion, occupying 542ft. by 160ft. wide, rises in the centre to the height of 110ft., with dome-like Louvre; covers 2¾ acres; cost 800,000 dols. Grand Pacific Hotel, 325ft. from east to west; 186ft. from north to south; 124ft. high to top of towers. It contains 500 rooms, and cost 1,000,000 dols. The Pacific Hotel Company intend it to be the best hotel in the world. Material, olive-tinted Ohio sandstone. Palmer House Hotel, eight stories; fronts 254ft. on State-street and 244ft. on Monroe-street; will have a French roof over all, the highest point of which from the ground will be 108ft. General style, Italian; first and second stories, Doric order; third and fourth, Composite; remainder Corinthian. Material, Amherst sandstone; cost, 2,500,000 dols. Wright's Hotel, eight stories; dimensions, 163ft. by 97ft.; contains 180 bedrooms. Commercial Gothic style; cost about 250,000 dollars. We pass over half-a-dozen similar hotels. Chicago *Tribune* Building, 72ft. by 121ft.; five stories high; roof composed wholly of iron; floors of English tiles of ornamental pattern. The building will be provided with a passenger elevator, running from the first to the fifth story, besides two sets of iron stairways; all the rooms to be heated by steam; cost 265,000 dols. *Staats Zeitung* Building, 110ft. by 40ft., six stories, 100ft. high. The material is manufactured stone; Italian Rennaissance style; cost about 125,000 dols. Many of the private business stores are quite as large as this.

Comparing herself with other cities, New Chicago thinks she has much to be thankful for. "While there are no very striking examples of architectural skill, there are few buildings, if any, that can be condemned, and there are many bearing strong evidences of culture and study of the art. We question," says the Report, "whether the architects of any other city in the country would have done better under the circumstances; in fact, we have so far seen nothing from the hands of the new comers from other cities, arrived since the fire, that can compare with the productions of our home architects. This may be due in part to the lack of opportunity to display their talents; but from what we have seen so far, we have no reason to change our opinion. Our new city has been made one of far greater interest and pleasure to live in, from the beauty and variety of its buildings, which cannot fail in its effect as a cultivating and refining influence upon the people. The task is now almost accomplished of making the new Chicago the handsomest city in the country."

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It is probable a vacancy may occur in the chair of the Commission of Sewers by the retirement of its present occupant, Mr. J. T. Bedford.

QUEEN VICTORIA-STREET, CITY.

WITHOUT wasting space in justifying the selection of name for this noble thoroughfare, it may be humbly put forward that Westminster already possesses a Victoria-street and that a Queen-street actually crosses Queen Victoria-street. The confusion thus caused in the matter of letter delivery is greater than can be realised, except by those whose addresses are either of these three streets. It is almost a matter of mere chance to which destination a not very accurately directed letter may be forwarded. The name should be Mansion House-street, and if it be advanced in deprecation that there is already a Mansion House-street, it may be answered that it consists of Gurney's "European," a tavern, of no pretension to architecture, and the Union Bank, with a great deal too much; besides which, the Union Bank entrance is round the corner in another street. However, as the collective wisdom of the Solomons of the Board of Works decreed the name, it must be relegated to the limbo of other mistakes from the same source.

In order fully to realise the importance of this street, the improvements in connection with it—the Embankment to wit—must not be lost sight of; this affords direct communication with the West-end by a macadamised road, free from omnibuses, and of such liberal width as to defy blocks or even slightly inconvenient crowding. When stables are established, as they doubtless will be, in the neighbourhood of Blackfriars, many who now come to business in omnibuses or broughams will supplement the early horse exercise of the Row by a brisk trot through the Green Park and along the Embankment; in short, Queen Victoria-street is the first really important thoroughfare connecting the west with the City. Holborn, it is true, is a fine street, but its fineness ends at Newgate-street, which, with Cheapside, may, during the busy hours of morning and evening traffic, be said to be in a chronic state of block. As to the financial success attending the construction of the new street, it is said to satisfy the most sanguine expectations, and its traffic and importance will be greatly enhanced when—as in the nature of things is sure to take place—Waterloo Station is superseded by a terminal London and South-Western Station near the present Mansion House Station of the District Railway, a Bill having been passed late last session to connect the District Railway at Hammersmith by a short branch across Barnes Common. It is worth notice that the first building erected in this street is immediately opposite the Mansion House Station.

Taking the buildings in the order in which the Board of Works has mapped them out, beginning at the west end, where Cannon-street is met: Plots Nos. 1 and 2, forming an almost equilateral triangle at the Church of S. Mary Aldermary—which, by the way, cuts a very poor figure, as it abuts cornerwise on the street, completely disfiguring the line of front—is named Crown Buildings. Being almost fully occupied, it has already made a handsome return on investment. Plots 3 to 10 inclusive, extending from Queen-street, Cheapside (confusion directly), to within 40ft. of Sise-lane, is taken by two gentlemen in partnership, who have also arranged to take an adjoining plot in Queen-street; this land, though now in a transitional state, will, when covered with houses, form a magnificent façade of about 600ft., the style being French Renaissance. It will have three entrances and three grand staircases, with the peculiarity of three lifts worked from one shaft, which will be in constant slow motion, by an ingenious arrangement allowing persons to ascend or descend at pleasure. The next plot, 11, taken by the Messrs. Christy, publishers, making the return in Sise-lane, will be a continuation of the last-mentioned design; and here we cannot help remarking the grand effect which will be produced in this street by having the blocks of six, eight, ten, or even more houses combined in one harmonious design. That each block should be like its neighbour is not what is meant. A good deal of Haussmanised Paris is monotonous. Turin, the most regular, is perhaps the most uninteresting city in Europe. The block immediately east of Sise-lane extends to Bucklersbury, comprising plots 12 to 15 inclusive on the Board of Works map, having a frontage of 133ft. on Queen Victoria-street, 115ft. in Bucklersbury, and 52ft. in Sise-lane. The foundations of the building to be erected on this piece of ground were laid in the spring of the present year. Great difficulties were encountered, this being the site of the old Walbrook which ran from Finsbury-fields to the Thames, by the wall of old London. Excavation to the depth of 40ft. was necessary in order to reach the London clay. That it was imperative to dig thus deep is exemplified by the condition of a new building on the south side of the street, also on the site of the old brook. This structure has given such unequivocal signs of failure in foundation as to be shored up with timber appliances. Coins bearing effigies of Vespasian, Augustus, and other of the earlier emperors have been found in course of excavation, besides knives and various *amphoræ* and *ampullæ*. One of the latter, pronounced by savants to be of a date long anterior to the advent of the Romans, was found at a depth of 23ft., and Roman foundations of chalk at 15ft. Also several wells of Roman construction of well-shapen, squarely cut and bedded, stones. This building is to be of the most florid style of Italian Renaissance design, and will be of Portland and Tisbury stone carved in the best manner. Besides a magnificent staircase, there will be a lift, the fittings throughout being of mahogany. A proof of the popularity of the street is the fact that the entire first floor of this building is already let at a rental of £150 per room, the actual building having only just reached the ground level. This block will be called Imperial Buildings. No. 16 on the map forms the link from the corner of Bucklersbury to Mr. Wheeler's present premises. In digging here, part of a barge, corn-laden, was found, covered with charred timber. Several bushels of the corn in a burnt state have been preserved by the proprietor of the ground. It is supposed that the barge came to grief in the Great Fire of London. The next block, "Mansion House Buildings," erected by Mr. Wheeler, the well-known hosier, is a corner plot, and so familiar to every Londoner as not to need description. Gothic architects may take heart of grace on seeing it. This is one of the situations where a round termination to a block is justifiable, and where a marked sky line, excellently given in this case by means of a circular tower in roof, gives a vertical character, which the wedge-like corner seems to demand. For the portion of this building which they occupy, Messrs. Mappin & Webb pay nearly £2,000 a year, while the smaller shops let for from £400 to £500. Here ends the north side of Queen Victoria-street, and crossing to the south, plots 17 to 21 form a triangle, the base of which is 158ft. in Queen Victoria-street; sides, 118ft. in Charlotte-row, opposite private entrance to Mansion House, and 115ft. in Bucklersbury. This plot has been rented from the Board of Works at £5,500 per annum, with option of redemption at thirty years' purchase by the National Deposit Safe Company. It is intended to erect a fireproof muniment house similar to those in existence in New York, Washington, and other American cities. The value of such a muniment house has been brought home to us even with the Transatlantic news of this very week. The excavation is calculated to reach 40ft., and the whole of the basement will be constructed of tooled granite. The contract is believed to exceed £100,000. From Barge-yard to Sise-lane plots 23 to 33 extend, held by several individuals, a noteworthy fact being that Mr. Webster, who supplies clocks to most of the English railways, and to nearly all the Indian and foreign railways, has taken plot 25, and removed his business from Cornhill, where it had been established for more than seventy years. The National Provincial Insurance Company are lessees of No. 26, having removed from Moorgate-street. The building will be one of the most imposing in the street, from designs by Mr. Vulliamy. It may be described as pure Italian. It is not of a forcible style, and might with advantage be bolder in projection of cornices, strings, &c.; but delicacy is a fault on the right side. This block consists of eleven houses. Next comes India Buildings, from Sise-lane to west corner of S. Antholin's, partially occupied. There is very little to say in praise of the architecture of this block. The style is one that has gone out. In the hands of Sir C. Barry or the late Mr. Cockerell the palatial style did not suffer. These buildings are neat and simple — a trifle too neat. They are fully occupied; Mr. J. Ebenezer Saunders, a member of the Common Council and Board of Works, having been architect. Plot 38, called Victoria Buildings, in the same style as the last named, is fully occupied. Plots 39, 40, and 41, forming the present limit of the street in a westerly direction, although noticed last, will bear favourable comparison with any in this or any other street in London. With a frontage of 140ft. on Queen Victoria-street, 63ft. on Queen-street, and 80ft. on Cannon-street, this block, called Albert Buildings, covers an area of nearly 5,000ft. The style is Venetian Gothic, freely treated. Seen from Cannon-street the effect of this building is very striking, though the cornice is undoubtedly overcharged with brackets and work generally. The stone used for the small fenestral columns which the fashion of the day seems to demand is marble from Dent in Yorkshire, the region whence comes also the celebrated Shap granite. A portion of the centre is occupied by the Messrs. Crossley as a carpet warehouse. The ends of this block are not finished, but every room is taken, even to the fifth floor. This desirable result has been mainly owing to certain internal arrangements, notably, to the use of a lift for conveying tenants and clients to the top of the house, being, we believe, the first instance of its special use for this purpose in the City. The proprietor was the first to start building operations in this street. He now owns, besides Albert Buildings, Imperial Buildings and a moiety of Queen's Buildings, or about a third of the street.

The architecture, as a whole, may be considered an advance. Some of the buildings might be more striking, more loaded with ornaments, more stuck all over with spikes and blobs and little silly balconies. The roofs might have soared more skywards, and rejoiced in clumsy trimmings in zinc, but for answering their purposes and ornamenting the City, the buildings in Queen Victoria-street may well compare with any purely business structures in London or elsewhere.

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BRIDGE ROADWAYS.—III.

THE solid cast-iron girder of the Hodgkinson flanged pattern, together with the intermediate brick arches, as described in our last article, may be taken as a type of superstructure very commonly met with in the earlier examples of railway bridge construction. The cast-iron girder, owing to its great weight and the large margin allowed in what is termed the "factor of safety"—that is, the ratio between the ultimate breaking load and the safe load to be borne by the material—partook in some measure of the character of its stone predecessor, and was less affected by the impactive influence of passing weights. It must, however, be carefully remembered that this insensibility to the action of moving loads is only obtained in cast iron by giving the girder excessive proportions, and cannot be regarded as an economical expedient. Of all materials, cast iron is the very last to be trusted when anything in the shape of a sudden and violent shock is liable to be brought to bear upon it. When simply subjected to a static pressure its great compressive strength will enable it to support very considerable weights; but once convert the statical into a dynamical force, and not only are its powers of resistance very seriously diminished, but its safety as a beam or girder becomes immediately imperilled. It was stated in our last article that "jack arches" were rarely used when wrought-iron girders were employed instead of those of cast iron, but that some few examples did exist of their being so employed. There is one example on a very extensive scale in Paris. It is the bridge at La Place de l'Europe, which carries the common junction of five main thoroughfares over a railway. The total area of roadway and footpaths extending over the bridge is about 8,000 square yards, an extent of surface which is not often met with in structures over railways, if we except such cases as those in which stations are erected at a low level, and these seldom support so much. In Fig. 1 is represented a longitudinal section of a portion of the roadway of the bridge under notice. The cross girders C C C are of wrought iron, with equal top and bottom flanges, instead of unequal flanges, as in the case of cast-iron girders, and are spaced 6·56ft. apart, from centre to centre. Between them are turned the jack arches, A A, which are 9in. in depth, and weigh, per foot run, 0·145 tons. The peculiarity in these arches is that the bricks are not solid, but hollow, so that the wrought-iron main girders are not loaded so heavily as the cast iron examples which have been already described. There was clearly the desire on the part of the designer of the structure to diminish the weight of the roadway as much as possible, and keep its general style in accordance with that of the rest of the structure. The black line in Fig. 1 shows the layer of asphalte, rather more than $\frac{1}{2}$in. in thickness, spread over the arches. The haunches are filled in with a description of thin concrete, which also extends over the crowns of the arches and the tops of the cross girders. This concrete weighs 0·108 tons per foot run, and over it is laid the metalling, which is 1ft. in depth, and weighs per same unit 0·356 tons.

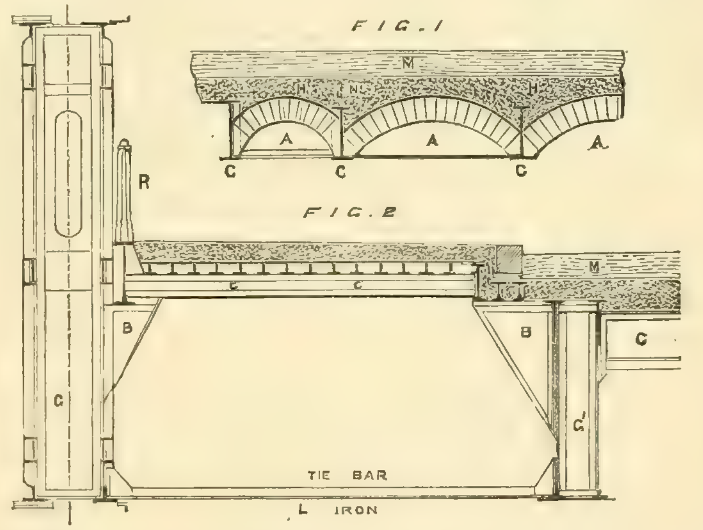
FIG. 1

FIG. 2

Some arrangement is evidently required to take the final thrust of the hollow brick arches supporting the roadway, as was explained in a former example, and the manner in which this is accomplished is very ingenious. It is manifest that although the arches rest upon the cross girders, yet the thrust of each half arch is resisted by that of its neighbour, acting in the opposite direction. This process of thrust and resistance is continued until we come to the last half arch, which has no fellow to take its thrust. This thrust is not taken by the abutment, as might be supposed, but the following method is employed:—The last cross-girder, upon which the arch rests, is tied by strong plate braces to the last cross girder but one at the points where it bears on the main girders, thus transferring the thrust to these points. As an additional precaution, the last two arches are tied, the last by a solid plate diaphragm, and the last but one by a flat tie rod. This arrangement makes the iron and brickwork to form one complete frame, so that if we were to imagine the whole superstructure lifted bodily from its supports, it would still be self-contained. If the thrust of the last half arches were taken by the abutments, the effects of the expansion, by alteration of temperature of the main girders, would be accumulated on them, and the consequences might be serious. By the method adopted the total expansion is subdivided at every cross girder, and the effect upon each arch is inappreciable. For small examples of bridges the plain tie rod answered well enough, but when the roadway reaches the dimensions of the bridge at La Place de l'Europe, a more scientific and complicated arrangement is necessary. The footpaths are supported by small cross-girders C C, shown in the longitudinal section, Fig. 2, and those in the centre part of the bridge between the central face girder and the nearest intermediate are the only ones requiring any consideration. They have a span of $14\frac{3}{4}$ft., and are placed $6\frac{1}{2}$ft. apart. The total weight each carries, including the weight of the single T-irons resting upon it and its own weight, is 8·5 tons. The single T-irons under the footpaths have a maximum span of 8·69ft., and their distance apart is $9\frac{1}{2}$in. from centre to centre. They are $3\frac{1}{2}$in. broad, by $4\frac{3}{4}$in. deep, and have a uniform thickness of 0·39in. The footpath consists of concrete covered by a layer of asphalte, and, as shown in the figure, has a rather strong fall against the kerb-stone. The cross girders are supported on brackets B, in Fig. 2, which are riveted to the main girders G and G'. The former of these is the face or outside girder, and the latter one of the intermediate main girders. Both of these are lattice girders, and therefore it is necessary to put a handrail R as a protection to the foot passengers, as the lattice bars in the side of the face girder are not sufficiently close together to act as a parapet. It is not unusual to witness plate girders with solid sides preferred to those of the lattice type, because by increasing the depth of the face girder, it can be made to act as a parapet. There are two objections to this apparent economical manner of proceeding. The one is that it is in reality a very expensive method of constructing a parapet, and the other that it constitutes a very unsightly one as well. Although it cannot be said that engineers have as yet attained to a very high pitch of æsthetical merit in their works of construction, yet it must be admitted that very considerable improvement in that direction has been made within the last ten or fifteen years. This is more especially apparent in the treatment of iron, which may now be regarded as the chief constructive material at our disposal. Hence, the art of dealing with it in an æsthetical manner has become an absolute necessity.

"AN ARCHITECT'S NOTE-BOOK IN SPAIN."*

A CONSIDERABLE responsibility is attached to eminence, and when Sir M. Digby Wyatt, the Slade Professor of Art at Cambridge, makes a reappearance as a literary man, which is, perhaps, the most suitable to him, the world is expectant of great things, and is inclined to be critical if disappointed. The volume just issued, entitled "An Architect's Note-Book in Spain," is sumptuous in its setting forth, quite an *objet de luxe* as to paper and printing, with ample margins, and cover resplendent with gilding. The delicate ornamentation of the binding, the author tells us, is a *fac-simile* of that upon a beautiful little Mudejar casket in his possession, and that he reproduces it in order to retain as much "local colour" as possible, rather than trust to his own powers of design. We wish he had been less modest in this respect, and had left to those who are not professors of art to seek safety in literal copyism of the works of past days, and we think it might fairly be required of one in his position to leave a record of what original nineteenth century art manufacture is or might be. The local colouring at best is but tame, and has, we hope, for the credit of the casket, suffered in the translation; it certainly would seem quite possible to invent another as characteristic and more appropriate. The subject principally treated of in the pages and illustrations is the domestic architecture of Spain—truly a fascinating theme. That country was the meeting ground of Classic civilisation and Mediæval chivalry, and of Moorish and Christian architecture. It was but a few days before we received these gleanings from that sunny land that a friend, who is well conversant with them, excited our imagination by a glowing description of the striking and charming pictures which it continually presents to travellers. We are obliged to own that the anticipations raised by the promise of one hundred sketches culled from such scenes have not been realised, and that the book is, in our opinion, unworthy of the high reputation of the author, and of the interest of the locality he has chosen to represent. We have always consistently objected upon principle to works which do not deal thoroughly with what they touch upon, and we have repeatedly deplored the tendency in the present day to produce desultory and ephemeral publications. We should be unjust, therefore, if we applied a different rule to this production by one who has gained a prominent position from what we have insisted upon in the case of mere aspiring students.

The boastful announcement upon the title-page made us afraid lest the contents should partake of that class of padding resorted to by the advertised brochures of 100 recipes for various culinary operations, and the confession made in the preface of the set purpose of book-making with which the author undertook his tour confirmed that fear. It savours of Yankee enterprise and practice that before quitting England for a first visit to Spain the author made up his mind both to see and draw as much of the architectural remains of that country as the time and means at his disposal would permit, and determined so to draw as to admit of the publication of his sketches in the precise form in which they might be made.

It is true that indulgence is requested for both literary and artistic deficiencies, but as there was not, as far as we are aware, any compulsion upon the Slade Professor of Art to publish at all, if otherwise than well, the demand is an unreasonable one. The world is not so large, nor its objects of interest so numerous, that we can afford that its choicest districts and richest treasures should be ransacked heedlessly, or that tourists, after hasty superficial rambles, should dismiss them with a Cæsarian crow of *Veni, vidi, vici*.

It may be true that, as Sir D. Wyatt alleges, havoc is being made among the architectural remains of that country, and gladly, therefore, should we hail students who would take section by section and preserve us careful and reliable records of even a portion; but immortality will be conferred upon few of its structures by these meagre and confused sketches, numerous though they be. Mr. Street's work on "Spanish Ecclesiastical Architecture" is referred to in the preface. It is a pity that with that admirable model before him the author did not, while he chose another department, treat his subject in like manner; but the truth is that his book will not bear comparison with that of Mr. Street. The domestic architecture of Spain, in spite of these 100 illustrations, yet remains to be dealt with. We shall, however, now try to glean what we can from the volume before us, which of course bears throughout the evidences of the well-known ability of its author, in spite of the haste which has prevented him from doing himself and his subject justice. With regard to the comparative value of its architecture with that of the other principal countries in Christendom, he remarks that: "To assert that Spain can teach the lessons to the architect which are to be gained from Italy, or even from France, would, I think, be to claim too much for her, but on the other hand, it should be remembered, that it is a mine which has been very much less exhausted. . . . If asked what paramount sensation Spanish architecture has produced in my mind, I think I should be inclined to say that of the manifestation of an entire indifference to expense. No one appears to have counted the cost of the work upon which he engaged. . . . I could not but feel, in looking at the works of Herrera, and of several other men, such as Diego de Silve, Gil de Ontamon, Henrique de Eyas, Alonso Covarrubbias, and Juan de Badajos, that there exists for architecture a just mean between their frequent extravagance and the sordid shabby spirit upon which we, from time to time, approach the question of expenditure upon 'public works.' The economy which consists in sobriety and simplicity of parts, especially in structures destined to subserve ordinary uses, is as much to be admired as the economy which aims at the combination of magnificence with 'cheese-paring' is to be deprecated and despised." In the above observations there is much good sense, which it is as well should have as much prominence given to it as possible.

Entering Spain from the south of France, Burgos was the first city visited. Rich in churches and other ecclesiastical buildings, not to speak of its strikingly-picturesque Cathedral, it is comparatively poor in old domestic architecture; one cannot but, therefore, pity our author, self-doomed "to turn from" the former, to avoid trenching on Mr. Street's selections, who certainly here had the lion's share, to the meagre fare of what he calls the Plateresque and later styles—unwholesome diet at the best. From such, we have two plates, the first of the Arco de Santa Maria, a Renaissance frontispiece that replaced an older and sterner portal which Mr. Street passed by, as we should have done, with the remark that it is a picturesque jumble of circular towers and turrets, looking more like one of those Mediæval castles seen in illuminations or over a figure in stained glass, than a real or useful fortified gateway. The other illustration is of the Patio of the Casa de Miranda, of which, as a sample of many of an interesting class, we may abstract the description. The Patio, or internal courtyard, is usually rectangular, surrounded by at least two stories of arcading, from which run passages to all the principal sets of apartments. An open staircase connects the upper with the lower arcades, and there is but one entrance by a great door guarded by a *concierge*. They are most picturesque and suited to the climate, and the effect from the street, looking into this courtyard through the open doorway, is very charming. Of this particular example, we are told that little need be said, yet little as to its detail can be gained from the sketch.

Valladolid supplies materials for six plates. A single day Mr. Street thought sufficient for its architectural features; for although he found it a pleasant place, picturesque and busy, he says, "It is one of those cities which were too rich and prosperous during an age of much work and little taste." What one man likes, another avoids, and Sir M. D. Wyatt found here food to his taste. Of this city he writes: "From early in the fifteenth century, through the reigns of Juan II. and his successors, until the elevation of Madrid into the Capital by Charles V., Valladolid was emphatically the Royal City of Spain. It is there, accordingly, that the traveller would naturally look for relics of royal and courtly magnificence." Plate VI. in this series is the first which has the appearance of being the work of a professional man, and this is an interesting and fairly well-drawn one of some detail from a small Patio, Colegio de San Gregorio. This is of good Gothic construction, but with regard to the window above it, illustrated in the preceding plate, with which the author is evidently in love, we are unable to share in his enthusiasm; as drawn, it seems an ill-proportioned opening, overladen with nondescript ornament in stucco, which material, says the author, "we of the nineteenth century affect to despise, and in the use of which both the Romans and the great masters of the Renaissance under Raffaelle's guidance, excelled, and the Moors delighted. By its use, they were able, with speed and accuracy, to supply the redundancy of conventional ornament, essential to contrast with the rigid geometrical setting out of lines and compartments which formed a fundamental law of their beautiful style of design." We think the material might be used to better purpose, and if it tended to redundancy in the style, so much the worse for the style.

While Mr. Street remarks that Valladolid has the misfortune to have a Cathedral built by Herrera, Sir D. Wyatt says, "it is a popular prejudice that gravity in Spanish architecture only came in with Herrera, after the middle of the fifteenth century in Spain, but in reality there were several other men who before him asserted their dissent from the picturesque redundancy of ornament, and designed works upon a careful study of Italian models of architectural proportion." We might quote the saying as to "when doctors differ," but for our part we feel relieved from the depression which at first we experienced from a recital of the destruction and decay which has befallen the "glories" of Valladolid.

Leon has afforded material for five of the plates of this series. The first is the Romanesque tower of the Church of San Isidoro, which is valuable as supplying an omission in the work of Mr. Street, who gives the ground plan and views of other parts of this structure. Of the Convent of San Marcos we have an exterior and interior view, of which so much cannot be said, for although Mr. Street avows that he forgot to visit it, he thought it a venial sin as being of the sixteenth century, from the designs of Juan de Badajos; and from Sir D. Wyatt's plates little can be made, for the details are indistinguishable, and the view of its cloister is a mere blotch. His sketch of the Casa de los Ensmanes (Plate XI.) is far better, and represents a building with some dignity and picturesqueness of composition for the work of one who, as the author says, "rejecting the elaboration of the Plateresque style, followed the simple and more chastened proportions recommended by the Early Italian writers on architecture, such as Alberti and Serlio, and by the first Spanish student of Vitruvius, Diego Sagredo, in his Medidas de Romano." Salamanca, the great university town, is answerable for nine plates. Sadly injured during the wars with the French, there are yet in the town many stately remains of public buildings of the period of the Renaissance. In such, of course, our author revelled, and two of his best sketches are Plates XIV. and XX., representing respectively the exteriors of the Casa de los Conchas and of the Casa Monterey, both tolerably grandiose masses of building. Of the former he says that upon the whole it is the most complete house of its period he met with, and answering in art, and nearly in point of time, to the florid Burgundian style of the Low Countries. The face of the masonry is, as it were, powdered with shells, the heraldic badge of its owner. The "mirador," or open arcading serving as a "look out" and place of exercise for the ladies, a picturesque feature imitated in the new Museum building at South Kensington, is more noticeable in the latter example. Several pretty façades of old Renaissance houses furnish subjects for other sketches in which the detail cannot be made out. The mode in which the ornament is concentrated is, however, worthy of imitation in better detail.

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* London: Autotype Fine Art Company, Rathbone-place.

From Avila (Plate XXIV.), the Patio of the Casa Potentura is one of the best renderings in the book of this suggestive feature. A passage from Madame d'Aulnois' letters from Spain, quoted in its description, is worth requoting, as giving a glimpse of the character of the domestic life in which this forms so important an appliance:—"All their houses have a great many rooms on a floor. You go through a dozen or fifteen parlours or chambers, one after another. Those which are the worst lodged have six or seven. The rooms are generally longer than they are broad. The floors and ceilings are neither painted nor gilt; they are made of plaister quite plain, but so white they dazzle one's eyes, for every year they are scraped and whited as the walls, which look like marble they are so well polished. The court to their summer apartments is made of certain matter, which, after it has ten pails of water thrown upon it, yet is dry in half an hour, and leaves a pleasant coolness, so that in the morning they water all, and a little while after they spread mats or carpets made of fine rushes, which cover all the pavement. The whole apartments are hung with the same small mat, about the depth of an ell, to hinder the coolness of the walls from hurting those that lean against them. On the top of these mats are hung pictures and looking-glasses. The cushions, which are of gold and silver brocade, are placed upon the carpet, and the tables and cabinets are very fine; and at a little distance there are set silver cases or boxes, filled with orange and jessamine trees. In their windows they set things made with straw, to keep the sun out, and in the evenings they work in their gardens. There are several houses which have very fine ones, where you see grottoes and fountains in abundance." Avila is a most interesting town, one of the most complete of the fortified towns in Spain, but the author's gleanings there are scanty. Beyond the building last named, only two iron pulpits have received his attention, and these may be as valuable as he describes, but their detail, from his sketches of them, is undecipherable, and their proportions are most ugly—like exaggerated wine-goblets.

The Escorial, in the neighbourhood of Avila, has lately attained eminence, through disaster, which it does not otherwise deserve. Mr. Street saved his time by not going out of his way to see it; but Sir Digby Wyatt, judging less truly of the work of Herrera, its architect, paid it a visit, which, we trust, was of service to him. He admits that his preconceptions were disappointed, and that he could find no beauty in it. His confession is too useful to be omitted. He calls it "the monument which reflects, probably, more perfectly than any other in the Peninsula, the mixture of arrogant extravagance and arid asceticism which characterised its most potent rulers in the plenitude of their historical importance. In it," says he, "in my opinion, Herrera proved himself an architect thoroughly worthy of the masters who employed him—formal, pedantic, cold, extravagant to a degree, and yet mean." May the lesson thus learnt, that grapes cannot be gathered from thistles, be taken to heart, and save others useless search for such freaks of nature and consequent chagrin.

From Segovia we have four plates, one of a gateway in the walls, and two details from the Alcarzar Palace in the highest part of the city. That which forms the subject of Plate XXX., is, perhaps, the most striking in the book. It is Mudejar work, of the date 1452—8, a rich example of stucco decoration, showing of what it is capable. From all accounts Segovia is a mine which might well arrest a less hasty student, since "there is probably no city in all Spain, and few, perhaps, in any part of the world, in which, within a similar compass, so many good though fragmentary materials could be found for illustrating styles and inflections of styles in building, from the days of the Romans, through those of the Moors and Christians up to the period of the Renaissance."

Toledo is the next place of importance, and is illustrated by fourteen plates. "Few cities," wrote Mr. Street, "can compete in artistic interest with this, and none can, perhaps, come up to it in the singular magnificence of its situation and in the endless novelty and picturesqueness of its every corner." Sir D. Wyatt gives us in one sketch an idea of its position in the ravine of the Tagus, and in others the effect of parts of two of the bridges by which that river has been successively spanned by Roman, Moor, and Christian, but nothing but this effect can be gleaned from them. Two horseshoe-arched gateways, or the ghosts of them, with dissolving views of donkeys in the foreground, form the subjects of as many very sketchy sketches. Some Christiano-Moorish campaniles are given to supplement Mr. Street's omission of the churches, and the picturesque but impure gateway of the Hospital of the Holy Cross, with the somewhat similar one from the Alcarzar as the reputed finest examples of the Plateresque style, but we close the series with the feeling that if Toledo deserves the praise bestowed upon it, it must contain work of higher interest than either.

In Seville, we have what the author terms a poor little sketch of the picturesque church of La Serla; we will not dispute the verdict, but would ask why it should have been poor, seeing the subject was well worth more trouble; as also the still better church of San Marcos in the next plate (LI.). Had the author a bee in his bonnet that he must drive on like the Wandering Jew, when he really must have had a building before him which he enjoyed? If such were the case, his tormentor must have been at his worst tricks. Here, just where Mr. Street had not forestalled him, and where the glimpses he gives us are of the very class for which we are thirsting, he treats us with Tantalus's cup, and dashes it from our lips before we have had time to sip it, since his sketches are really nothing but scrawls.

Granada has furnished twelve illustrations, out of which the Alhambra has sat for its portrait in eight plates, and in some of them several details are given to an intelligible scale. A pretty sketch of the internal side of the Puerta de Justicia is accompanied by a description of the ingenious method in which the passage through the gateway has been arranged for the purpose of defence, and by notes of the coloured tiles which decorate its internal façade, which few, if any, are equally capable of making. They appear to have, as a speciality, some peculiar deep granulated blue, well worthy of notice. The description again, to Plate LXXI., of some wonderful glass inlay from the Hall of the Ambassadors, and his conjectures as to the mode of its execution, are just what the previous studies of the author have fitted him to make, and for which we cannot but be thankful, and wish that such matter had occupied a larger proportion of the volume. Those who would study Moorish ornamentation will do well to read carefully these notes with reference to Mr. Owen Jones's carefully coloured plates of the Alhambra. Many lessons in art are to be gleaned thus, even though we hesitate to endorse the boastful inscriptions on its walls, which the author has translated, or to admit that the style of art is of the highest, notwithstanding its mechanical consistency, with the nine canons quoted from the Guide to the Alhambra Courts of the Crystal Palace. Before quitting Granada, we would call attention to the description accompanying Plate LXXVI., "The Screen or Reja of the Reyes Catolicos;" after reading it, the sketch, which would otherwise have been passed over, will be found to repay closer examination.

At Guadalaxara, the façade Palacio de los Duques del Infantado, is represented in page 78, and in the description is stated to be one of the most important of the palaces of the ancient nobility left in Spain. Mr. Street has given a view of its Patio. The two plates, and the remarks accompanying each, together give a good idea of the building; the most suggestive portion of which is the top story outside, with its continuous arcading and circular projecting balconies, which must be exceedingly picturesque.

Saragossa appropriates six illustrations, but the architecture there is coarse. Barcelona has more worthily occupied nine plates. The half-fortified house of the fifteenth century is Plate LXXXIX., and the Patios in Plates XC. and XCVI., with their staircases, are thoroughly good. The central arcade of that in the Casa de la Disputacion is a delicate one of Gothic arches upon slender, perhaps too slender, marble columns, only 2in. in diameter, and charmingly proportioned.

Gerona closes the list of the 100 plates, with three illustrations of a fortified house; one with a semicircular arcaded upper story, and a picturesque portion of the old walls and towers of the town.

In taking leave of this volume, and acknowledging that the inspection and perusal of it has afforded us considerable gratification, it is impossible to deny that it has been sadly alloyed with regret. In thoroughness, it will not, as we have said, for a moment compare with Mr. Street's work upon the Ecclesiastical Gothic architecture of the same country; and as a specimen of art work, it will not enhance the reputation of the Slade Professor of Cambridge, who should teach by practice as well as precept, that whatever is worth doing at all is worth doing well.

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The magnificent new terminus at Berlin, built by the Berlin and Potsdam Railway Company, has just been opened.

The Tees Scoriæ Brick Company (Limited), of Middlesborough, is announced. The capital proposed to be raised is £10,000, in shares of £10, and the concern is formed for the purpose of working a patent of Mr. J. Woodward, of Darlington, for utilising the scoriæ or slag from the blast furnaces, by manufacturing it into bricks.

The military authorities have entered into the sewage contest, and advocate the application of carbon as a deodoriser to sewage.

A company has been formed in Canada to construct a suspension bridge over the Niagara at Queenston, for the use of the Lake Ontario Shore and other railroads.

It is proposed to apply to Parliament for powers to raise £5,000,000 more capital to alter and enlarge the docks at the Sandon Basin, Liverpool.

THE GREAT FIRE AT BOSTON.

It is scarcely more than twelve months since that the world was startled with the news of the Chicago fire, and now we have news almost as startling of a similar catastrophe at Boston, United States. The fire there has destroyed 959 buildings, including 21 banks, 46 insurance offices, and 27 newspaper offices, and 35 persons have been killed. The loss in money value is estimated at 250,000,000 dollars, or about half of the estimated loss at Chicago. The progress of the fire was stopped by blowing up buildings. When Chicago was half destroyed the wonder was not so great, as that city was known to contain not only an unprecedented amount of inflammable material, such as bacon, but inflammable houses also. Boston, on the other hand, which has been called the Athens of America, consists principally of substantially-built houses, and the warehouse in which the fire originated was built of granite. When a catastrophe like this has happened it is very easy to be wise after the event, as some of the public writers in this country are now proving. In all probability a concurrence of circumstances contributed to the result, and instead of finding fault with the manner in which municipal authorities do their duty, or the fire brigade perform their's in America, we should learn a lesson from the disastrous event, and endeavour to keep our own houses in order.

One thing, on which we have again and again written, is sufficiently proved by the Boston fire and the destruction of the City Flour Mills, Thames-street at the same time—namely, incapacity of iron as a fireproof building material. Mr. R. W. Edis, in an opportune letter to the *Times*, says:—

"As a general rule, in London the new warehouses and buildings that are yearly erected are built without any special fireproof construction—that is to say, wood is almost invariably used for flooring and roofing purposes, without special plaster protection, and the wood beams are supported on cast-iron stanchions, or columns, which invariably fail, and break or twist with great heat, or on the application of water to their heated surfaces. In the exceptional buildings, such as the great grain warehouses just destroyed in Thames-street, the whole construction was supposed to be fireproof, and special care was thought to have been taken in its carrying out to insure the localisation of any fire and to prevent its spreading generally throughout the building. This has entirely failed, not only as a fireproof construction, but has materially added, by the contraction and expansion of the iron and the failure of the supports, to the instability of the general fabric and to the difficulties and danger of the Fire Brigade. I had an opportunity of seeing and carefully inspecting the various buildings destroyed in the recent conflagrations in Paris, and embodied my experience of the so-called fireproof construction therein used in a brief paper read at the last Conference of British Architects. Here, where stone and iron was used to a very large extent, it was found that the strength of the stonework was utterly destroyed by the enormous heat, so that the action of water or damp caused its complete disintegration, and made the walls and piers unsafe. The stone staircases and balconies, where not solidly supported at each end, but simply tailed into the walls, as usually done in our London houses, split and broke away from the walls—failed, indeed, at the onset, and under ordinary circumstances would have proved sources of destruction rather than escape to inmates and firemen. Where, however, the walls were of brick or of stone protected by plaster they, as a rule, were invariably fireproof, and, except where thrown down by the expansion and dragging of the iron girders, remained erect and generally sound. Where ironwork, either wrought or cast, was used in floor or roof construction without any plaster protection it was twisted and turned like riband, and although not adding actual fuel to the flames, did more damage by breaking and snapping than any wood construction could possibly have done. The iron supports, as a rule, invariably broke or were bent out of the perpendicular, so as to allow the floors and roofs which they were supposed to support to fall in and drag the general fabric with them; and, to quote Captain Shaw's new book on 'Fire Surveys:'—'When it is remembered that at a temperature of 212 deg. Fahrenheit, or the boiling point of water, cast-iron loses about 15 per cent. of its strength; that at the temperature of molten lead, 612 deg. Fahrenheit, it has probably no strength at all; and that at a temperature of 2,787 deg. Fahrenheit, which is probably much below that of the centre of a large building on fire, it becomes liquid,' it can hardly be wondered that so little remained of this so-called fireproof construction. The floors, which proved themselves almost fireproof, were those constructed of light iron joists about 2ft. apart, filled in with plaster of Paris, or with ordinary brick or tile arches, with the undersides plastered and the tops covered with cement or tile flooring; these only failed by the failure of the unprotected iron supports beneath them. Generally it was evident that good plaster work, either in walls or ceilings, invariably, in a great measure, was fireproof; and that stone and iron construction without such protection was not only useless, but much more dangerous than good sound wood beams and posts, brickwork of every description, and good wood floors, well pugged and protected by plastered ceilings. With the experience thus gained, is it not time that those in authority should insist on a more careful system of fireproof construction, and reject as useless those materials which in all the late fires have hitherto been in themselves supposed to insure safety, unless protected by plaster, or other known fireproof material? It is, of course, impossible to make any building absolutely fireproof, but what is essentially desired is that in great store warehouses the space of each section of the building should be divided by good brick walls into as small divisions as possible, compatible with the absolute requirements of the building, each shut off by double iron doors; that stone should be used in floors and staircases nowhere except where solidly supported at each end and protected by plaster: that iron girders should be laid loose in the walls so as to allow for expansion, and that these, together with all iron supports, should be encased and protected with plaster; in fact, that the experience gained in the last two years should be at once made use of for the protection of London, and to insure the greatest possible amount of fire resistance in our buildings without increasing the danger to the stability of the general fabric, and thus add materially to the danger and difficulty of the Fire Brigade, and to the lamentable risk of loss of life such as has occurred in the destruction of the so-called fireproof building in Thames-street."

In another part of to-day's impression we have offered some observations on the wonderfully rapid manner in which Chicago is being rebuilt. It would be interesting to know more particularly what has been done there in the way of preventing the spreading of fire in future, and, as we have many readers in Chicago, we should esteem it a favour if one of them could enlighten us on this point.

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MR. RAWLINSON ON HEALTH AND COMFORT.

On Thursday week, Mr. R. Rawlinson, C.E., lectured at the Social Science Rooms, Adam-street, Adelphi, upon Domestic Sanitary Works and Arrangements Necessary to Comfort and Health. Mr. Rawlinson set out by laying down the broad principle that, in order to secure health and comfort by the observance of sanitary rules, mutual action was a necessity, and that such action was best directed by the State. Law created ownership, and law should control ownership. We had so far advanced in this direction that chronic or epidemic ill-health was exceedingly rare in our prisons, but at the same time it was a fact to be lamented, and not only lamented but grappled with, that good health was almost an impossibility in some of our rural cottages. The law might and did do much in England to add to the health and comfort of the people by increased sanitary control, but the action of the law would lack much in good effect, if it found itself opposed by the action, or even the inertia, of the individual. They must remember that as their single houses were, so would be the aggregation of houses that formed villages, towns, and nations. It was the prime duty of the Government to make healthy houses possible for the people; but in the meanwhile the people might do much to improve what they had, and to take care that when they made fresh ones they should be built upon sound sanitary principles. Of such principles he would instance that before a house was built care should be taken that the sub-soil was dry, and when they came to build they should see that the ground-floor was not below the level of the road. Houses should not be built upon a level cut in the side of a hill. When the cholera was prevalent in Alnwick in 1849, a detailed report of the state of the town came into his hands, and he found upon examination that in all cases where the houses were built in streets running in a sort of valley, with high ground back and front, the cholera was raging in those streets, whilst houses close by, but built under more favourable circumstances, were free from the plague. Sometimes his advice was asked upon the sanitary condition of houses, and when he had gone over the structure, and pointed out where it might be improved, he was met by the objection that the suggested alterations would cost too much. Cost—supposing the person seeking the advice had the money to carry out the work—ought not to be a consideration as opposed to health; and if the person had not the money to do what was wanted, he had better go and live in a smaller house, and see that that was in good sanitary order. One defect—which was very common in west-end houses in London, and to which, since the illness of the Prince of Wales he had frequently called attention—was, that the drains were not connected with the sewers. The builder made the drains and the parish made the sewers, and it was nobody's business to see that the juncture was effected. This was an exceedingly dangerous state of affairs, and merited instant attention. Other practical hints given by the lecturer had reference to the necessity for ventilation in public rooms and private houses, the enjoyment of pure water, and the observance of strictly and minutely cleanly habits. He was, he said in concluding an interesting and instructive address, reminded, when studying or expounding the arrangements necessary to comfort and health, of the case of Naaman the leper. Naaman, when told by the Prophet to "Go, wash in Jordan seven times," scouted the remedy because it was so simple. People thought that the science of the preservation of health was something very abstruse, and not to be approached except through devious and not easily-learned paths. But he (Mr. Rawlinson) declared that its leading principles might safely be summed up in the admonition, "Wash and be clean."

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PRIZES OFFERED BY OR THROUGH THE ARCHITECTURAL ASSOCIATION.

During the session just commenced the members of this Association will compete, we hope in large numbers, for the following prizes, which are offered by or through the Association:—

Offered by the Association.—*To Members of the Association.*—A prize of two guineas and a half for the best essay on either of the following subjects, viz.:—1. A Monograph of John of Pavia, or Sir John Vanbrugh. 2. On the Influence of Material on Gothic Architecture. 3. Timber as used in Building Construction. *To Members of the Class of Design.*—A prize of two guineas and a half for the best series of sketches contributed in the class during the session; and a prize of one guinea and a half for the second best series. *To Members of the Class of Elementary Design.*—A prize of one guinea and a half for the best series of studies submitted during the session. *To Members of the Class of Construction.*—A prize of two guineas and a half for the best series of papers submitted at the meetings of the class, and a prize of one guinea and a half for the second best series.

Offered by Sir W. Tite, C.B., M.P., F.R.S., F.R.I.B.A.—*To Members of the Association.*—A prize of five guineas for the best design for a country mansion, to cost not more than £10,000, estimated at 9d. per cubic foot; the method of arriving at the cubic contents to be given. The stables and out-buildings are not to be shown. The accommodation and other requirements are left to the competitors. The drawings to comprise a plan of each floor, and two sections drawn to a scale of one-sixteenth of an inch to a foot, two elevations to a scale of one-eighth of an inch to a foot, and one sheet of details as large as imperial paper will admit.

Offered by the Architectural Union Company. — *To Members of the Association.* — A prize of £5 for the best series of measured drawings from existing buildings in England, or portions of the same, erected previous to the eighteenth century. A prize of £2 10s. will be given by the Association for the second best series. (*Mem.*—The object of this prize is to obtain a series of drawings showing construction, the jointing and bonding of masonry, and general framing of timbers. Detailed drawings to be made to a scale of not less than half an inch to a foot, and mouldings, &c., at least one quarter full size.)

The prizes offered to the several classes will be regulated by the governing body of each class, subject to the sanction of the Committee of the Association. All work submitted for any of the above prizes must be delivered at the rooms of the Association, addressed to the Honorary Secretaries. The Essay and Class of Construction Papers on or before the 30th August, 1873, and the drawings for the other prizes on or before the 27th September, 1873. Each document to be under motto, and accompanied by a sealed letter signed by the competitor, bearing on the outside the same motto, for the purpose of identifying the successful competitor with the work sent by him. There must also be inscribed upon the cover the number of separate drawings or other work sent, and the title of the prize for which it is offered—any neglect of these regulations may prevent the work being submitted to the judges. No member is eligible to compete for any one of the above prizes who has already obtained the corresponding prize in a previous year. In order to afford an opportunity to members and their friends to contribute towards the prizes, it has been determined to institute a "Prize Fund," to be distributed either in grants towards the expenses of members in their sketching tours, or in any other way the Committee may determine.

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ON OLD ART AND NEW ART.*

WE are all familiar with the argument which, while it admits that the great artists of history, whether Greek or Italian, may have conceived and realised an ideal of the human form which in these days we cannot pretend to rival, yet insists that ideas on this subject are, to use a modern vulgarism, "played out"—that we want our art to be more in accordance with the spirit of the age, which is an age of realities and progress, that our art must be above all realistic, and show us nature as we see her around us, and that it must also progress and keep pace with the advancement of science and education so as to give us something new. I do not say that the argument put in this broad and coarse form exactly expresses the opinion of any really thoughtful persons, but it is at the root of much that is written and said on the subject, and that by persons who have the command of a great deal of art-education in this country, and who at all events imagine that they have well considered the subject; and it is plausible enough to require refutation, for it is apparently not obvious to every one at first sight where the great distinction lies between science and art which should restrain the latter within certain impassable boundaries, while there is apparently no limit possible to the discoveries and novelties of which the former is capable; and persons who hold these views do not see how essential it is to the very existence of an art that it should have an ideal of beauty—that, as it can only appeal to our minds or hearts through our senses, unless it does so on some principle of choice or selection, we gain no more from it than we gain from the observation of nature itself—that the human form and face, containing as they do the highest qualities of beauty which nature presents for our admiration, the study of them with a view to rendering the most complete abstract expression of their beauty and vitality, is the highest to which an artist can devote himself—that the aspects not only of human but of all natural beauties, being the same in all ages, there is no new discovery to be made in the matter; and so, not seeing, or caring to see, this, they cannot judge how near perfection in the attainment of this ideal the art of the past arrived, or how nearly it reached the limits outside of which it is incapable of further development, and, not feeling competent to discuss this point, willingly concede to Greek art the achievement of a perfection for which they know the crown has always been awarded to it. What they desire, in fact, is an art which shall appeal more directly to minds incapable of appreciating its more elevated characteristics; and this, they persuade themselves, would be a higher development, because appealing to a wider range—of what?—not of sympathies, as they imagine, but in truth, of minds incapable of wide sympathies. Moreover, the argument that the progress of knowledge has given us new and more varied themes for expression, and therefore tends to produce a further development of art, must fall to the ground, unless it can be shown that these themes are of a kind that lend themselves specially to artistic treatment.

The truth is, that any attempt to rival or surpass the *chefs-d'œuvre* of the past must be made on the same conditions and in the same spirit that animated the producers of those great works. Were science to discover for us the cause of every natural phenomenon that exists, nay, were it to reach the final cause of life itself, the glow of the evening sky would be none the more or less beautiful, nor the grace of a child's movements one whit diminished or increased. These, indeed, are eternal beauties and unchangeable, and they are what the artist has to treat of; and though he may never be able to arrive at the complete expression of them, he can see to the end of them, for they live for ever for his continued contemplation.

I have no hesitation in saying that art has lost more than it has gained by our modern modes of thought and feeling, and that if it be asked why we cannot put away the traditions of the past, and work in the modern spirit, the answer is that the modern spirit is becoming daily more opposed to the artistic spirit, and is precisely what hampers its expression; that what is good in the art of to-day is good in the the same way, and for the same reasons, as the old is good; that we have no lights on the subject which were not also clear to the old masters, and that where we seem to have struck out a new path, we have only chosen one which they purposely and rightly rejected; where we seem to have discovered a new truth, it proves to be one beside the question.

Now, there are, I think, two causes to be found for the immense difference in the aim and results of our modern work as compared with that of the ancients. I should have said, rather, that there are two ways in which the modern spirit is opposed to the artistic spirit; and one of these is in a noble direction, and is due to the spread of a philosophy—I might almost call it a religion—which insists on the recognition of certain qualities, moral and Divine, inherent in ideas or impressions of beauty, which recognition is necessary on the part of the artist [to the production of a high form of art. The second, or ignoble way, may be broadly stated as due to the fact that artists, from motives of indolence or interest, have allowed themselves to be led by the opinion of the public, instead of being, as of old, indifferent to it, and themselves leading the way to a better appreciation on the part of the public of the capabilities of art.

Now, both these causes have curiously enough led to the same result; I mean they have both been instrumental in leading to a prevalent belief that the imitation of nature, or perhaps I should say the record of his impressions of nature, is the aim and purpose of the artist. It will be necessary, then, before going further, that we should inquire in what way and how far a mere imitation of nature may result in a work of art. And, in speaking of imitation, I must be understood to use the word in the sense of copying. Fuseli defines the difference between copying and imitation in this way: "Precision of eye and obedience of hand are the requisites of the former, without the least pretence to choice, what to select, what to reject; whilst choice, directed by judgment or taste, constitutes the essence of imitation, and alone can raise the most dexterous copyist to the noble rank of an artist." But it seems to me that it is impossible for an artist not to choose what he is going to paint; he may choose stupidly, but a choice of some kind he must make, so with this difference I take his definition of copying as what I mean by imitation.

When I say that the belief or which I am speaking is a very prevalent one, I judge not so much by what is said and written on the matter as by the large quantity of merely imitative work which is to be met with in our numerous art exhibitions, and the amount of success such work meets with. Now, it is quite true that an imitation of nature may be a work of art; when at its best it calls forth all the highest technical qualities of the painter, the qualities that distinguish him as a painter from the poet, who describes nature in another way.

This precision of eye and obedience of hand requisite for the rendering of colour and form, include the whole art of painting, and are found in perfection only in the work of the most highly-gifted artists; but they are, distinctly, only the painter's qualities, and exclude the mental. Moreover, being the qualities which are necessary to his existence as a painter, and without which he is nothing, they take the lowest place among the artistic faculties. But the fact remains, that a mere imitation of nature—what is called realistic painting, though I should be inclined to call it materialistic—(I have already endeavoured to explain in a lecture on "Beauty and Idealism" how a true realism is one of the highest forms of art)—the fact remains that this imitative painting may be so admirably done as to become of a high order of merit. It is the essence of portrait painting, though for a good portrait other qualities are doubtless required. It is the essence also of landscape painting, though for good landscapes other qualities are required; and it is all that is necessary for still-life painting. But it is only the groundwork of ideal art, and is akin to the language by which the poet expresses his thoughts. It is, in fact, the language of art, and may be used by the artist for the three purposes following: It may be used to describe the ordinary aspects of nature, and through the knowledge of these aspects to express his selection of what he considers best worth describing; and thirdly, to give form to his imagination, which is the result of the selection and combination of the impressions he has received, the strength of our imagination depending, according to Mr. Darwin, on the strength and variety of our impressions, on the rapidity with which they are conveyed to our mind, and our power of retaining and combining them. Mr. Ruskin also explains the imaginative faculty in art to be a certain mode of regarding or combining the ideas which the mind has received from external nature; so that is the highest art which gives form to the imagination of the artist, not that which records impressions received immediately from Nature herself; and this imaginative faculty in the hands of men of great genius is of a truly creative kind, for is not the result of their combinations akin to the creation of a new world for the enjoyment, intellectual and moral, of those who can appreciate their inspirations? Has not Michael Angelo, indeed, created for us a new and superior order of beings, the grandeur of whom may indeed be felt but not defined, in whose honour writers have exhausted language in the attempt to give utterance to the emotion called up by his power: concerning whom Reynolds said, "I feel a self-congratulation in knowing myself capable of such sensations as he intended to excite;" of whom Fuseli wrote, "His women are moulds of generation, his infants teem with the man, his men are a race of giants;" and Ruskin, "His inexplicable power proceeds from an imaginative perception which is almost superhuman, which goes whither we cannot follow, and is where we cannot come; throwing naked the final, deepest root of man, whereby he grows out of the invisible and holds on his God home;" and, again, he speaks of "the troops of terror torn up from the earth by the four-quartered winds of the Judgment, making the hair stand up, and the words be few"—language which indeed bears witness to the high nature of this creative power, for of none other could the like be used. So, then, the aim of all high art is—of all art (except that which professes to be portraiture) should be—to create a world in which our imaginations should be excited to the contemplation of noble and beautiful ideas; and in proportion as it fails to do this, so does it differ from the great work of the old masters, who never had any aim but this. And here is the reason why I put landscape painting in the second rank of art; for though the impressions recorded be of the highest beauty, still it is but a record and an imitation—an imitation, it is true, coming rather under the head of Fuseli's second definition, as "being directed by judgment and taste"—an imitation most difficult of accomplishment, and requiring for its expression artistic skill of the highest order, on account of the subtle and fleeting effects which it is the delight and glory of the landscape painter to recall to our minds. Of the same nature of this highest form of landscape is the more elevated form of portrait painting, which aims at recording not only the features and costume, but all the noblest characteristics of the subject, but takes a second place as being a recording, and not a creative, art. Lower than this must be placed what is called still-life painting, and that kind of landscape which is of the matter-of-fact portrait kind; these again, however beautiful the subject chosen for imitation may be, only appeal to us in so far as the subject in nature itself appeals to us, or pleases us according to the amount of technical skill displayed. Still lower again is that kind of realistic portrait painting which we find in the modern French school, which presents a specious appearance of originality by ignoring the necessity for presenting the subject to us under an agreeable form, and so repels us in spite of an undoubted technical skilfulness, to which kind of realism I am not sure that I do not prefer our own fashionable school of portrait, as showing the faint tradition of a desire to ennoble the subject by the treatment; while the basest degradation of the art is revealed in that brutal rendering of noble subjects in which the French realistic painters take especial delight, where with insolent bravado everything is done with a direct intention of disgusting us, as showing the superior pretensions of an ignoble and ferocious nature over the purity and dignity with which such themes have been hitherto invested. Of this kind is the Salomé of Regnault, which it is worth while to compare with the graceful treatment of the same figure by the early Italian painters. Nearly on the same level, but not always so low, are the Dutch painters, who treat us to gross representations of drunken scenes; not so low, because the pleasure in these things is merely stupid, and not cynical, as with the French; and sometimes, as in the case of Ostade (who does not always condescend to these subjects, but as often paints for us the homely pleasures of a contented, if somewhat degraded, peasant life), there is a perception of the poetical beauty of glowing light and softened and mysterious shade, and a delicate skill in rendering them, which makes us forget the poverty and grossness of the idea. Not so, however, in the same scenes as painted by Jan Steen, whose remarkable power of rendering expression only adds to his disgrace; so that one may say that the better the art displayed in the imitation the more base is the result.

(*To be concluded.*)

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* Read by PROFESSOR EDWARD J. POYNTER, A.R.A., before the Royal Institution.

MINING INSTITUTE AND WOOD MEMORIAL HALL, NEWCASTLE-UPON-TYNE.

THIS building, of which the Wood Memorial Hall forms part, was erected principally for the accommodation of the members of the coal trade, as well as of the mining and mechanical engineers of the north of England. It was designed by Mr. Archibald M. Dunn, of the firm of Dunn & Hansom, Newcastle. The edifice is constructed from what may be termed a French-Gothic model, the two fronts being executed in Prudham stone, with bands of red sandstone at intervals, and insertions of Shap Fell granite, and the interior arrangements are—on the ground floor a board-room of 23ft. 6in. by 21ft. 6in. for the directors of the Blyth and Tyne Railway Company, as well as commodious offices for the secretary and other officials. The members of the Mining Institute have a full set of offices on the first floor, as well as two large council chambers, one 28ft. 6in. by 20ft., and the other 23ft. square; and, in addition to this, the necessary accommodation for the members of the coal trade provided on the same flat as well. The top story is apportioned for general offices—some of which are already occupied by the professors of the Science College. The cost of the whole undertaking is nearly £20,000. The contractors for the work were Messrs. Howard & Son, of Newcastle. The Wood Memorial Hall forms a conspicuous part of the building, and is distinguished externally by the gable which rises above the roof of the main block, and the large window which is so prominently inserted into it; while a striking feature is furnished by the apex of the gable being appropriately surmounted by the figure of a pitman, who, with pick on shoulder and Davy lamp in hand, is supposed to be trudging away to his hazardous occupation below ground. Admission to the hall is obtained through the principal entrance of the Mining Institute—immediately opposite to the Stephenson Monument—but, in addition to this, easy access can also be gained from the rooms of the Literary and Philosophical Society adjoining. The hall, which is entered from the first landing on the staircase, is about 70ft. in length by 29ft. in width, with a wall height of 27ft., and a clear height of 39ft. 6in. to the ceiling. The walls are lined with polished Caen stone, relieved by the introduction of bands of red sandstone over the side arcades. It has a panelled ceiling of stained wood, supported by half-a-dozen semi-circular moulded ribs, with an enrichment in the soffit. These ribs rise from coupled serpentine marble shafts, with carved caps and moulded bases, and display at the foot of each column a shield, on which is inscribed the arms and monogram of Mr. Wood. The carving reflects credit on Mr. Roddis, of Birmingham. The apartment is lighted at each end with very large five-mullioned tracery windows, having circular heads, and being filled with delicately-tinted glass by Mr. Cooke, of London. These windows, which are of six lights, are divided into three tiers each; and in addition to appropriately bearing the arms and monogram of the Wood family, an accompanying inscription sets forth that "This hall was erected 1870, by public subscription, as a memorial of Nicholas Wood, the first president of the North of England Institute of Mining and Mechanical Engineers; died 19th December, 1865, aged 70 years." A panelled wainscot dado, 7ft. in height, protects the lower part of the walls around the room; while the recesses formed by the arcading on each side have been filled up with shelves in such a way as to give accommodation to a large number of books. Immediately opposite the entrance to the room, and occupying the centre of the arcades, is placed a life-sized statue of Mr. Wood. The figure, which has been carved in white marble, is the work of Mr. Wyon. The remaining arcades, nine in number, are intended to be occupied by full-size portraits of the leading engineers of the district; and models of machinery, and other apparatus relating to mining operations, are intended to be appropriately placed on stands beneath them. When this part of the scheme is accomplished, and the panels of the roof receive their golden decorations, the interior will not be excelled by that of any building in the north. The Memorial Hall, which is superbly fitted with Gothic furniture, is connected with the Literary and Philosophical Society by means of a fireproof passage, and thence with the Museum and Natural History Society; while, with the Medical College—the members of which have rented some of the basement premises of the new building for a lecture room and laboratory—there is also a direct communication at the rear. It will thus be seen that the advantages of the different places can easily be made accessible, and hence they must not only prove of great value to the members themselves, but also to the students of the Physical Science College, who undergo their training in the same place.

PROPOSED NEW ROUTE TO PARIS.

THE annual rumour of a new line to Brighton has reappeared, but there seems to be but small chance of such a line being really made. But there is a prospect of a new source of revenue for the existing Brighton line in the through traffic between London and Paris. The new steamers now projected will, in the opinion of the *Railway News*, make the Newhaven and Dieppe route the shortest, most comfortable, and cheapest route to France. With such steamers it will be in every way an advantage to have the longer water carriage and reduced land carriage, and with arrangements to take the goods waggons on board, the route *viâ* Brighton will not fail to take the lion's share of the traffic. The distances are—

Via Dover and Calais :—

	Rail.	Water.
London to Dover	73	—
Dover to Calais	—	22
Calais to Paris	184	—
	257	22
	22	
Total	279 miles.	

Via Newhaven and Dieppe :—

	Rail.	Water.
London to Newhaven	53	—
Newhaven to Dieppe	—	70
Dieppe to Paris	125	—
	178	70
	70	
Total	248 miles.	

saving in railway carriage 79 miles, in the whole distance, 31 miles. In time, the Newhaven and Dieppe route will take 9½ hours.

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BUILDERS' BENEVOLENT INSTITUTION.

THE 25th anniversary dinner of this deserving charity took place on Thursday evening, the 7th inst., at Willis's Rooms, King-street, S. James's, the President of the Institution, Mr. Edwin Lawrence (of the firm of Lawrence & Sons), in the chair. The institution was founded in June, 1847, by Mr. Thomas Cozens, for giving relief and granting pensions to decayed members of the various branches of the building trade and their widows, also for affording temporary relief to workmen in cases of accident. It has now 45 pensioners on its funds, 20 males and 25 females, the males receiving annuities of £25, and the females, £20 per annum. The usual loyal and patriotic toasts having been duly honoured, the Chairman, in proposing the toast of the evening, "The Builders' Benevolent Institution," said that at present the Institution was possessed of a fund amounting to £13,200, and had a sum of rather more than £3,000 to be devoted to a building fund whenever they thought fit to build. At the next election, which would take place on the 28th inst., there would be four pensioners elected, being two more than the usual number, but this did not represent any progress on the part of the Institution, as two of the vacancies were caused by the decease of pensioners. It was to be regretted that the subscriptions were not larger in amount and more numerous, so as to enable the directors to provide for more of the many applicants who were eligible for relief from the Institution, as well as to increase to some extent the amount at present paid to the pensioners—a step that was almost a necessity, considering the greatly enhanced price of all the necessaries of life. Since the Institution had been established it had paid away more than £16,000 in pensions, and that sum had increased the comforts of many a poor but once prosperous home. No trade was subject to greater vicissitudes than the building trade, and he hoped that all the subscribers would do their utmost to respond to his appeal to get new subscribers. The toast was enthusiastically received. The other toasts were "The Chairman," proposed by Mr. George Plucknett (Cubitt & Co.), the treasurer; "The Patrons, Vice-Presidents, and Trustees," responded to by Mr. Russell Freeman; "The Treasurer," in responding to which Mr. Plucknett made a powerful appeal in aid of the charity; "The Architects," replied to by Mr. Henry Strudwick; and "The Directors," responded to by Mr. Wilfrid Nicholson, who contended that the Institution was not all adequately supported by the building trade—a trade in which, he said, more capital was embarked, probably, than in any other, not excepting even the cotton trade. During the evening subscriptions to the amount of £315 were announced by the secretary, Mr. A. G. Harris. Mr. Harker officiated as toastmaster, and the musical arrangements were under the direction of Mr. Winn, assisted by Miss Marian Severn, Miss Agnes Drummond, and Mr. Kerr Gedge.

HEALTH AND ARCHITECTURE.

WITH all that has been uttered in Parliament' written in the newspapers, discussed at social science congresses and professional meetings, it is lamentable to think what little progress is made in sanitary matters in connection with building. The *Times*, in commenting on a lecture delivered by Mr. R. Rawlinson on Health and Architecture, says there is certainly no subject in which the prevalent recklessness is more disastrous than in that of house-building and house-management, and there is none which illustrates more conspicuously the failure of science up to the present time to make its influence generally felt. Mankind have lived in houses for countless generations, and one would expect them to have acquired at least some empirical knowledge of the requisites for a healthy habitation. Men in general, not to speak of professional architects, might have been expected to be familiar with such matters as the conditions of a good foundation and the means of securing ventilation and warmth. But Mr. Rawlinson does not exaggerate the least in describing the mass of modern houses, not even excluding altogether those of the very wealthy, as betraying an utter neglect of such points. "He durst not tell the meeting all that came within his knowledge on the subject;" but we could wish he had not shrunk from his revelations. What he says is bad enough, and it is unquestionably true. "There had been a great blunder committed in draining many West-end houses—making no connection with the sewer; and though the defect had been pointed out over and over again, no remedy had been applied." This is an example of what may be observed at one end of the scale. Fine houses are springing up every day in the west of London, and fabulous prices are paid for them. The purchasers, no doubt, are duly assured that all the subsidiary arrangements are in accordance with the best modern practice; the occupier pays his sewer rates in secure confidence that he is deriving all the benefit designed by the grand scheme of metropolitan drainage, and yet all the while his drains are not in connection with the sewer. For the other end of the scale the reader may turn to a paragraph in the *Times* of Saturday on the "Dwellings of the East London Poor." We need only quote one fact. These houses are generally built on so-called "made ground," or ground composed of "refuse and *debris* of all descriptions." A portion of this refuse is organic, and soon fills the houses with poisonous gases. Such houses are separated, perhaps, by flooring-boards from reservoirs of small-pox or scarlet fever. Other houses, perhaps a little better off, are built upon damp ground, without any attempt to make a dry and secure foundation, and the miasma of the soil soon poisons the health of the inhabitants. It is unnecessary to say, for it corresponds to the experience of most classes, that "no attempt is made to secure scientific or effective ventilation." The occupants have to choose between cold and incipient suffocation, and they prefer the latter. We reported only the other day an inquest on a woman who died in a "cellar" at Mile-end Old Town. A "cellar," it should be explained, in this connection means simply an underground kitchen. This woman lived alone with a child of three years of age; she gained her living by selling fruit, and paid 1s. 9d. for her "cellar." One morning she was found dead; and the cause of death was "effusion of serum into the pericardium, brought on greatly by living in such a wretched dwelling." This room was described as "very dark, without any ventilation, and totally unfit for human habitation." The majority of the jury, not, however, without a protest from some of their number, insisted on the room being condemned. But there are thousands of such "cellars" in London, in which "the only light and ventilation are through an iron grating in front," and the depression of life which they occasion is cruel and incalculable. This poor woman's little boy will now go into the workhouse. What good would he have been likely to be of in the world if he had been brought up till the age of twelve in this wretched den? Mr. Rawlinson justly says that "the fountain and prime element of all value in this world is human life; healthy human life having the greatest value." This prime source of national strength is being poisoned by wholesale among our lower classes, and is far from retaining its purity even among the wealthy. What task can be more important, Mr. Rawlinson asks, than that of checking such waste?

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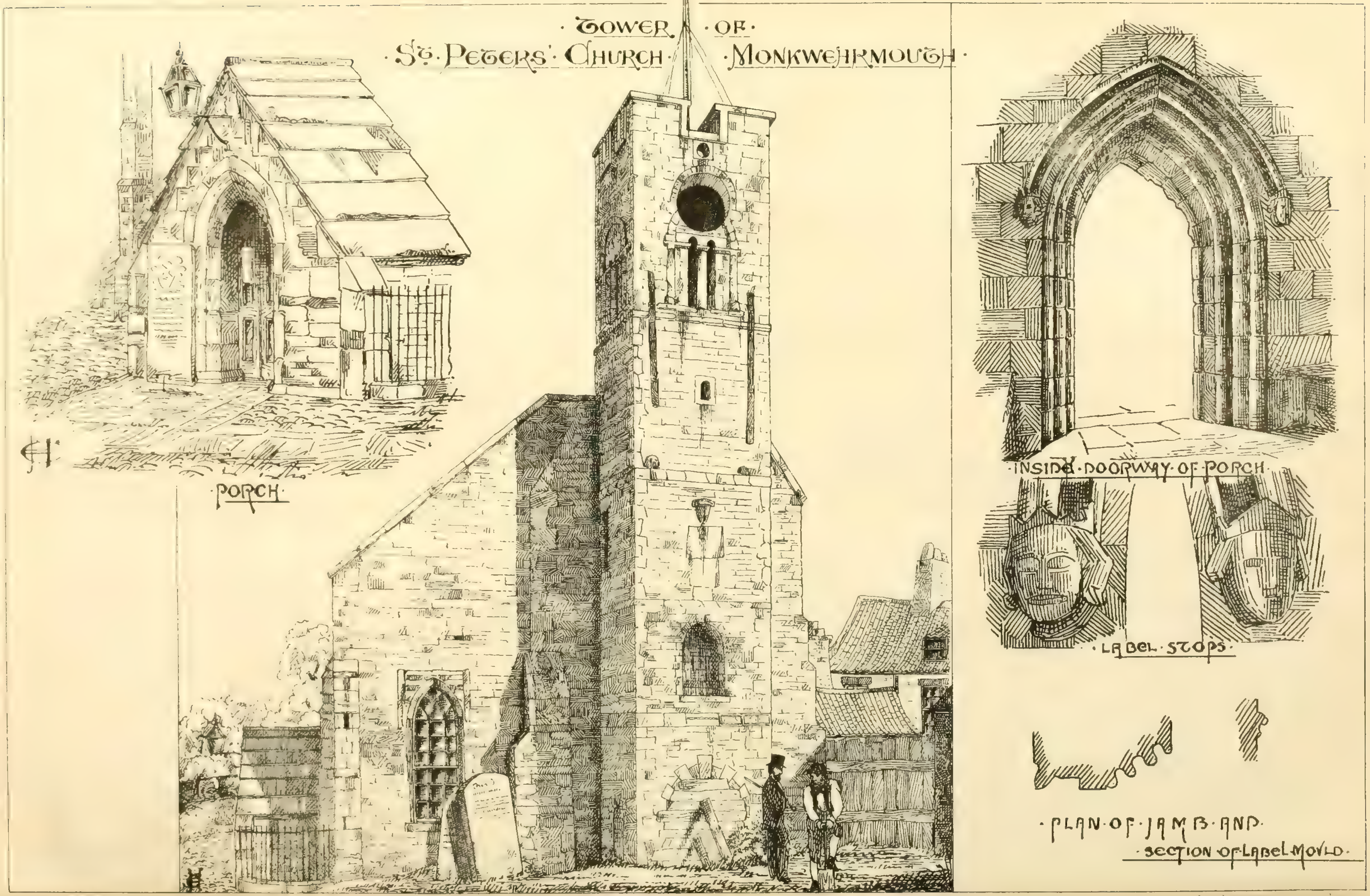
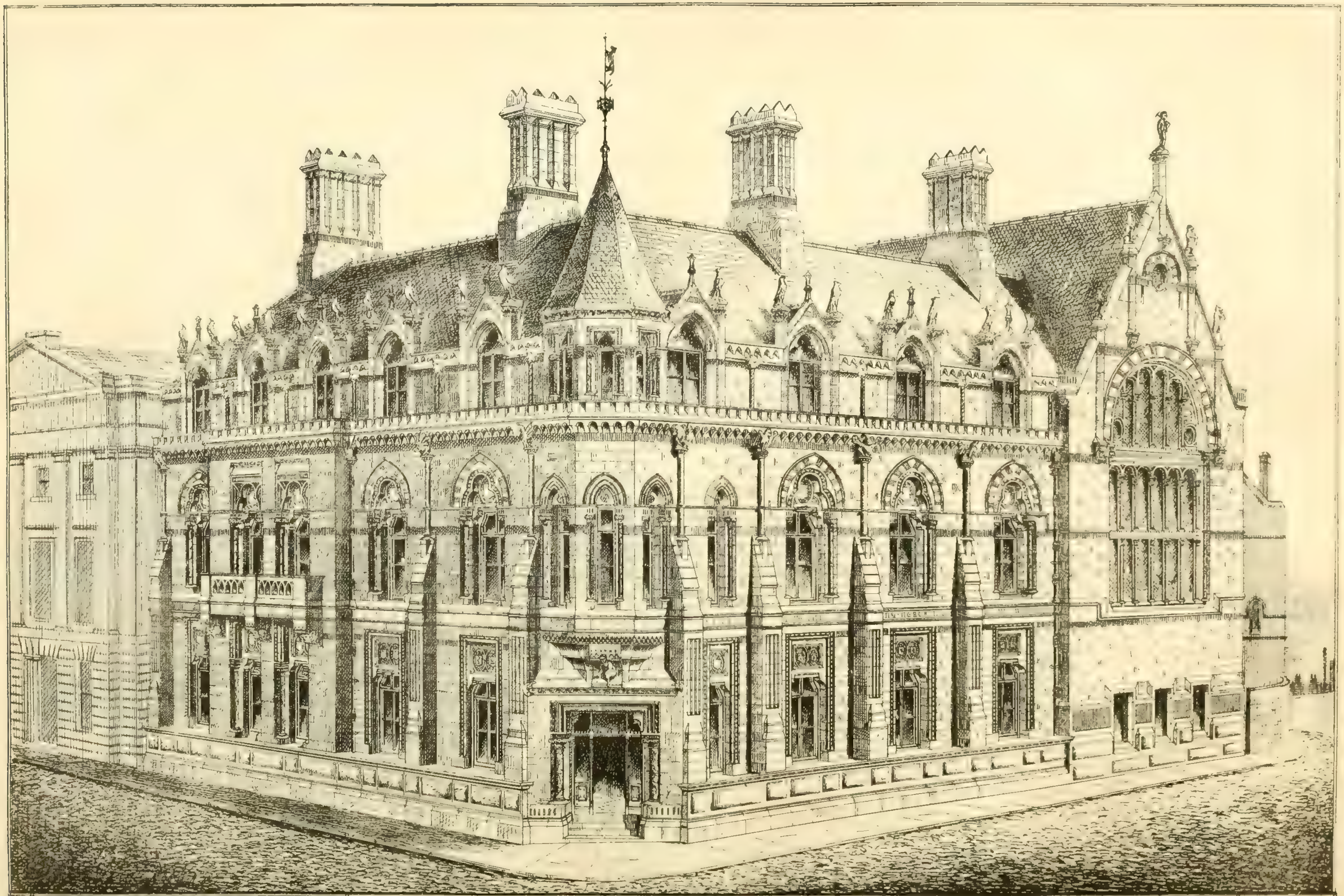
The necessary machinery for treating the sewage at Birmingham with lime, according to General Scott's process, having been completed, a trial was made on Friday at the southern tank at Saltley, in the presence of Dr. Frankland.

·TOWER· ·OF·
·ST. PETERS' CHURCH· ·MONKWEARMOUTH·





Mining Institute and Wood Memorial Hall: Newcastle-on-Tyne.

A. M. DUNN
Architect 1870

CUSTOM AND INVENTION IN ART.

In a paper on "Fashionable Art and Artists" I endeavoured to show the narrowness of professional prejudices—the utter slavishness of the majority of popular architects, who are led by some movement or by some pronounced expression of sentiment. It was shown also that this weakness or proneness of architects to pander to such conventions or fashions of thought arises from a defect in modern "professional" art-training, in not developing individual talent and inventiveness. Under the present *regime*, "draughtsmanship" and copyism become, in spite of assertions to the contrary, the real aim and object of architectural study. The patronage and encouragement afforded by our architectural societies are unmistakably in this direction. Prizes and inducements are held out for the best measured sketches or drawings of old buildings—never for the most original idea or method of construction. The Architectural Association is certainly doing a more useful service in its classes of design, by calling out individual talent and inventive minds from among the herd of poor, dull, mediocre, or fashion-enslaved draughtsmen, but it may go much further. We have had enough of the representative kind of architects, and we value their contributions towards the archæology of the art. But the line must be drawn distinctly here. Professor Kerr remarked at the Association that our art must not end on paper, nor should reverence for the past be carried so far as to blind us to a critical investigation of the merits or demerits of old work." But I would go much farther than Professor Kerr. Let old buildings be studied only as the past history and biography of art, not as teaching vital principles. It would be absurd to expect genius from a study or perusal of the lives of great men, and yet this is what our art instructors chiefly insist on with regard to art—that it is derived by a close painstaking study and imitation of ancient examples. Nothing can be a greater fallacy. It is certainly still more erroneous to confine such a study to only one phase or style of art. Eclecticism is far better than that. The error in all such teaching is that of neglecting the conditions under which ancient art and buildings were erected. To show to what extent this fallacious and ignorant method of teaching art is carried, Mr. Street accepts the challenge of Professor Kerr in prophesying a disastrous time for Gothic. Upon what ground does he do so? Simply because the younger members of the profession have arrived at a great pitch of excellence in "draughtsmanship." I may be permitted to say this is by no means a good augury. On the contrary, it shows how much more *slavish* and mechanical we are getting; in fact, I assert in proportion to our instrumental perfection our mental art power of design is diminished. This may appear a paradox to all accomplished sketchers and draughtsmen. If mathematics, mechanics, and the physical sciences were taught more, and mere drawing and example-sketching less, we should have infinitely more art power and greater original artists. The Middle-Age artist had not a hundredth part of the facilities of the modern artist in copying: he had no published sketches, and fewer chances of seeing old buildings. His work was eminently practical, experimental, and thoughtful. The result is clear. Actual experience amongst artificers, constant observation of the requirements of his work, and the solution of ever-recurring difficulties, with a mind able to grasp them as they arose without the aid of foreign ideas or the vocabularies of art we have now, was all he needed; in fact, such vocabularies and precedents stifle and hinder contrivance. Clerks of works and builders' foremen, who have had few of an architect's facilities in these matters, often put to shame their masters.

Mr. Street further discountenanced criticism among the profession. Now, this is the only safeguard it possesses. If we were to fall into an apathetic mood, expressing no opinion as to what our brother had done, our architecture would soon be reduced to a dead level of mediocrity. If free discussion is so essential to society and individuals it must be more so to the productions of a class. There is a tendency among a particular class to fall into narrow grooves of thought, and the public, while it may expose some of these which affect ordinary notions of propriety, cannot, so well as members of the profession itself, discern weaknesses and imperfections in a technical point of view.

Another fallacy, equally apparent upon slight reflection, is reported as being suggested by the same speaker—viz.: "Until you have mastered one page of a book do not turn to the next;" and "a man who skims a book and fancies he knows all its contents does not know so much as the man who endeavours to master it 'bit by bit.'" Now, this "bit by bit" method of mastering a subject has been the ruin of modern architecture and its professors. It gives us details instead of general principles, and makes specialists instead of artists. It encourages "matches" from Italian, French, and Spanish art, and insists on draughtsmanship as the one essential to be mastered before anything else. It is true, nevertheless, that the "bit by bit" method is more profitable than the more regular and general system of training, because it gives to its followers a better chance of making a name and winning a position. It would be invidious to make reference to one or two especial advocates of the "bit by bit" or "specialist" school who have made a mark. Unfortunately, the "bit by bit" school does not always begin at the beginning, and therefore betray an ignorance in the fundamentals of art which he who generally comprehends is less liable to. It is, as Professor Kerr remarked, more difficult to thus begin and know all the pages than to confine one's attention to only one page.

We cannot shut our eyes to the utter ignorance some of the profession display in scientific knowledge allied to architecture; how frequently we have to call in engineers, physiologists, and other scientific men in consultation, or in correcting blunders, particularly in sanitary and other matters. The idea that it is better to learn one thing thoroughly than a great many imperfectly is as mistaken as it is commonly received; what, indeed, would be said of that man who in the ordinary concerns of life studied his appearance or pleasure at the risk of his health and pocket?

In another paper I will continue this subject as bearing upon the undue influence of custom in restricting invention, and in the mean time I would say to all artists fettered by custom and conventional training—study Mill's essay on "Liberty." G. H. G.

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WOOD WORKING MACHINES.*

The pages of the technical journals and a few papers read from time to time before scientific societies excepted, little has been written regarding wood-working machines before the appearance of this book. Its publication supplies a want, and the execution of the work is, for the most part, all that could be desired. The author has his subject well in hand, and his practical experience is well seconded by his literary ability. The book is carefully printed, and the illustrations well engraved.

In the short history of wood-working machinery with which Mr. Richards prefaces his work, he remarks that no other branch of invention seems to have been so fully developed or so nearly perfected at one time, and by one man, as that relating to wood-working machines by Sir Samuel Bentham, the brother of the celebrated writer on political economy. Educated at Westminster, and apprenticed to the master shipwright of Woolwich Dockyard, Bentham was in 1779 directed by the Government to undertake a tour in the north of Europe for the purpose of examining into the progress of shipbuilding and other arts. During this tour, while in Russia, he invented the first wood-planing machine worthy of the name. A machine for the purpose had, it is true, been patented in England in 1776 by Hatton, but it appears, practically, to have been inoperative, and can hardly be considered either to have inspired or anticipated Bentham's invention. Of the nature of Bentham's machine nothing is known, but it is conjectured that it worked on the reciprocating principle, by some means closely analogous to the hand operations of the time. On his return to England in 1791, his brother, Jeremy Bentham, had received a Government appointment to introduce industrial prisons into England. The labour utilised in these institutions being almost devoid of skill, Sir Samuel Bentham set to work to devise machines to supply this want and to make the labour more profitable, and his brother's house in Queen's-square Place, Westminster, was converted into the first manufactory of wood-working machines. The fact that the premises soon proved too small, and that another building at 19, York-street, had also to be occupied, leads to the inference that a great many machines were made, and the notice of the Government led to another commission to Bentham to visit different dockyards, to determine how far his machines could be employed to facilitate shipbuilding, but it was not until 1797 that the Admiralty authorised their introduction. In 1810 he was joined by Brunel, and in 1813 he was, after arbitration, allowed the sum of £20,000 for machines furnished to the dockyards and penitentiaries. The mere list of Bentham's specifications during this period would take too much space; we must content ourselves with remarking that the slide-rest for turning is fully described in one of them issued in 1793.

There is one remarkable machine—the circular saw—which seems to have been originated by another inventor, Samuel Miller, of Southampton, in 1772. Miller's machine appears to have contained nearly all the elements of the modern American saw-mill, except the propelling power. The next important contributor to the progress of this branch of industry was Joseph Bramah, who, in 1802, patented a machine which may be considered as the origin of the "transverse" or "traverse" planing machine—a type found to this day, with but little modification of his plans, in all large wood-working factories. In 1808 William Newberry patented the band saw, but somehow the utility of his invention was not perceived until comparatively recent years. The patents of Brunel, granted from 1805 to 1808, bear testimony to the gradual increase of knowledge on the subject, but in 1822 an American, Boyd, or Blemchase, patented the copying system in the United States. The various machines tributary to this important patent will be found fully noticed. From 1815 to the Great Exhibition in 1851 little advance was made in England in the construction of wood-working machines. This had by no means been the case in the United States, but the principal ideas in the construction of the American machines were economy of cost and rapid work in the hands of skilled men, and as neither of these elements fitted them for English use no great attention seems to have been paid to them. Their performance in the Great Exhibition, however, caused considerable astonishment, and English makers at once proceeded to adapt the ideas embodied in them to a more perfect mode of construction.

Special adaptation to varying circumstances are the requisite characteristics of wood-cutting machines, and they differ in this respect from most other classes of machinery. Iron is the same all over the world, so are wool, cotton, and flax, but the soft deal of northern climates and the hard woods of the south, as Mr. Richards observes, differ almost as much as rosewood and cast iron. The operations, too, in wood working are more varied, and the want of information relative to high speeds for shafts, cutters, &c., tends to hinder the adoption of a standard form of construction. That fixed principles exist and rule the operations of machines for cutting and shaping wood material of a like nature with those which govern the familiar rules that guide the engineer in his estimate of the strength of material or the force of heat, no one doubts, but that they are not yet fully laid down is equally certain, and we agree with Mr. Richards that our better acquaintance will not be the result of discovery or invention, but of the record of carefully collected facts, the results of observation and experiment by those who build and work such machines, and that only when these facts are sufficiently developed to form a full and tangible basis for theoretical deduction will further progress be rapid. At present hand performance is the only tangible basis for estimating the work done by machines, and as hand operations have in the past embraced all we can hope to accomplish with machines in the case of wood, Mr. Richards lays down the following propositions:—

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* "A Treatise on the Construction and Operation of Wood Working Machines," &c. By J. Richards. London: E. & F. N. Spon.

First.—The object of machines in wood work, as contrasted with hand labour, is to augment force to guide cutters in true lines and secure a greater rapidity of movement.

Second.—The direct effect of machines is as the amount of cutting edge that can act in a given time.

Third.—This effect or result is limited by the nature of the operations and by the accessibility of the surfaces of the materials to be operated on.

Fourth.—This limit of application governs the relation of machine to hand labour, and whenever hand manipulation approaches what can be done with machines they should not be used, and cannot, with profit, be applied.

Fifth.—The performance of any machine in relation to hand labour can by these rules be predicated, and its labour-saving effect be determined.

For the elaboration of these premises the reader must consult the book itself.

The differences in construction between the wood-working machines of England and America is well treated of. The author points out that in America the machines are generally sold to men of limited means, whose first great object is to get started in business. In a few years the machines pay for themselves; the increased dimensions of the business warrant a larger and more permanent investment, and the old plant is replaced by an improved one. Again, the machines are made for, and sold directly to, the parties who use them, with the full certainty that they will be returned on the maker's hands if not efficient. The English market is a more general one, large numbers of machines being sold to mercantile houses for exportation; and unless machines are made to special order, they must be constructed on such plans as will come most nearly to general adaptation. The skill to be employed in operating the machines must also largely govern the details of their construction. In America the high price of skilled labour makes labour-saving the most important consideration. Finish, taste in design, and good fitting, are as nothing compared with the question as to the amount of stuff that can be "got through" in a given time. In Chicago 45,000ft. of pine are surfaced on one side in a single machine in one day, and machines to be sold must come up to this standard. Similar machines in use in England, or made for exportation to countries where labour-saving is a second consideration, could not compete in the Chicago market.

To the combination of functions in wood-working machines, as in the "Universal" machines, Mr. Richards is unfavourable. He observes that a machine arranged to do several things is generally supposed to do but one at a time, hence the more functions it has, the greater are the proportions of idle parts. Machines to work, *to pay*, must run fast, and continuously, and not be encumbered with parts which have nothing to do with the work immediately in hand. For this, and for other reasons, he is of opinion that only in very small shops, where one man can accomplish all the work, or in very large establishments, where one man can do the irregular jobs without disturbing the standard machines, are universal machines useful. The question of the comparative merits of *ribbed* and *cored* frames is a subject of some interest, and is fully dealt with. Members of the Institution of Civil Engineers may remember that in a paper read before that body, in 1858, by Mr. G. L. Molesworth, C.E., mention was made of the frames absorbing the vibration from the cutter spindles, and in the discussion that followed, the merits of wood frames, on account of their greater elasticity and consequent power of absorbing the jar and vibration, was admitted by several members. Mr. Richards believes that the idea, though a popular one still, is a mistaken one. He is of opinion that the vibrations of cutter spindles can be best resisted and absorbed by rigid framing to supports, and that a solid and firm connection between the cutter spindles and the lumber supports is the first condition to be observed in the construction of frames, and that as far as strains are concerned, cored sections are generally preferable to rib ones. On the question of bearings he is again, in some instances, at issue with generally received ideas, and his remarks are well worth consideration, as are those on reciprocating motion and rotary balancing. The circular saw, though first used in the Netherlands in the seventeenth century, obtained its fullest development in America, and that only recently. There, the immense consumption of wood necessitated attention to cheap forest cutting, and, accordingly, the best skill and the greatest experience were brought to bear on the improvement of sawing machinery. The gang saw, the Muley saw, and the circular saw, were successively tried—the reciprocating gang-mill being still, however, most largely used for general lumbering purposes. The Muley saw-mill has almost entirely been confined to the Western States. It is simply an expedient to increase the rate of teeth-movement in a reciprocating saw, by dispensing with the tension frame and all possible weight in the reciprocating parts. A light cross-head is mounted in guides at the lower end of the saw blade, and to them the end of the saw and the connecting-rod are attached. The upper end of the saw carries another still lighter cross-head working in guides mounted on a pendent support. Above and below the log the saw blade is guided by lateral wooden supports, with its end bearing against the plate. The lower guides are stationary, the top ones moving to suit the size of the logs. Thus, little of the saw is exposed, and no chance is left for it to deviate from its course or to bend, and the lumber cut is therefore more true as to dimensions than that cut in any other kind of mill, and commands a higher price on account of its smoothness. The saw plates, when new, are generally 12in. wide and one-fourth of an inch thick, the stroke is from 20in. to 24in., and the number of revolutions from three to four hundred a minute.

With regard to the band saw, Mr. Richards thinks it must supplant every other kind. Its advantages are so many and so obvious as ultimately to triumph over mere mechanical difficulties. The tendency of the flexion of the steel in passing over the pulleys to crystallise and break the saw has, of course, been the crowning obstacle to its introduction. The difficulty of joining the blade has, however, disappeared, and the breaking of the saw is being avoided by improvements in its manufacture.

Planing machines, mortising machines, dove-tailing machines, and shaping machines are all fully dwelt on in the book, to which, for want of more space, we can but refer those interested.

Civil Engineering.

THE NEW WAVERLEY BRIDGE AND STATION, EDINBURGH.—The construction of the new Waverley Bridge Station will be completed in the course of a few months. During the past twenty months the contractors have been busy with the construction of the iron bridge which now spans the railway. The bridge is skewed at both ends, in different directions, and in this way presents a length of 310ft. on the east side 293ft. in the centre, and 276ft. at the west side. There are four spans, irregular in length, supported on three rows of cast-iron columns. These pillars number twenty in all, are octagonal in shape, with plainly moulded capitals and bases, and rest on stone piers. The south span is 96ft. in width at the east, and 84ft. at the west side; the middle span is 96ft. wide at both sides, and the remaining two are respectively 51ft. and 67ft. wide in the centre. Resting on the columns are the main lattice girders, made of malleable iron. The girder is 6ft. in depth, and the gas and water pipes are carried through the lower transoms. Above the lattice are the upper cast-iron transoms and buckled plates, on which rest first a bed of asphalte, next a bed of concrete, and above all the causewayed pavement. The railing is of cast iron, of massive design. The width of the bridge is 76ft. 6in., of which 48ft. are taken up with the roadway, 12ft. with the east and 10ft. with the west footpaths. The entire length of the bridge, it is anticipated, will be opened for traffic in a month. Messrs. Hannah, Donald, & Wilson, Paisley, are the contractors for the ironwork, and Mr. R. Hutchison, Edinburgh, for the mason work

THE MERSEY TUNNEL, LIVERPOOL.—Considerable progress has of late been made with the preliminary works at Woodside and elsewhere in connection with the proposed tunnel under the Mersey. Little, indeed, remains to be done to complete the preliminary stage of the operations, and as it was not until the works had become thus far advanced that a sound estimate could be formed of the difficulties of tunnelling beneath the Mersey, their present stage is an important one. Operations were commenced at Woodside in May, with the sinking of an oblong shaft 40ft. long by 10ft. wide. After passing through 20ft. of made ground, the sinkers came upon the pebble beds, or hard red sandstone; and through this rock the shaft has been cut 65ft., making its depth at the present time 85ft. It is necessary to explain, in passing, that from the bottom of this shaft the tunnel or tunnels (for there are to be two) under the river, as well as the tunnel under Birkenhead, will be constructed. From this point the work will be carried on in both directions, and here the whole of the refuse will be brought to the surface. This is the chief object of the shaft at Woodside, for the station for Birkenhead is to be nearer to the end of Hamilton-street. On the piece of vacant land between Bridge-street and the Docks the shaft for this station has already been commenced, but has not yet been sunk very deep. The sinkers at Woodside have now got down to the level for headings, or to about the top of the tunnel arches, and 9ft. more of sinking will bring them to the formation level or the floor of the tunnel. This 9ft., however, will not be taken out until some progress has been made with the headings, as in cutting tunnels it is usual to work from the top instead of from the bottom. A heading towards Hamilton-street, 8ft. by 8ft., has been begun, and now extends about 30ft. Some sixteen men are engaged upon the work, but twenty has been the average number employed on the shaft. The rock, so far, has been found perfectly sound and not very wet. Notwithstanding the large size of the shaft, so little water drains into it that one of Tangye's 6in. steam pumps is more than sufficient to keep it dry; and, what is of some importance, the water does not drain in from the river, but is ordinary fresh water. Whilst the sinking of this shaft has been going on, steps have been taken to ascertain the character of the bed of the river. From the Birkenhead side to within 300 yards of the quay wall of the Manchester Dock, borings were taken at every three chains, or 66 yards. These have shown that the bed of the river is composed of rock of the same character in every respect as that through which the shaft has been sunk at Woodside. At every point but the last where borings were made the rock was bare, but at 300 yards from the quay wall there were 10ft. of sand between the water and the rock. A boring has also been taken at the bottom of James-street, and here the red sandstone is only 30ft. from the surface. Between this point and the last river boring the bed of the river is now being tested, and no doubt is felt that here, as at all the other places, will be found the hard dry red sandstone. From the light thrown on the question by the sinking at Woodside and the borings, the engineers, Mr. Brunlees, Mr. Fox, and Mr. Tolme are of opinion that there is really no physical obstacle to the construction of the tunnel. The only difficulty is a financial one, but the tunnel is admittedly of such great importance to the commerce of the port that it is thought that when the undertaking is fairly before the public this difficulty will disappear.

Milford Haven and its New Pier.—At a meeting of the Society of Engineers on Monday week, Mr. Jabez Church, President, in the chair, the paper read was on Milford Haven and its new pier works, by Mr. Henry Davey, C.E. He commenced by referring to the natural advantages of Milford Haven, which Lord Nelson once pronounced to be "one of the best harbours in the world." Although there was a mean fall of 22ft., at spring tides, the largest fleet could at all times easily find shelter and security in the Haven, with good working room. The area of the main portion of the estuary from Blockhouse Point to Cosheston Pill, above Pembroke Ferry, was stated to be at high water, 8,810 acres, and at low water 6,855 acres, at one fathom deep at low water spring tides, 5,354 acres: at three fathoms, ditto, 4,245 acres; at five fathoms, ditto, 2,951 acres. The author considered that the great rise of tide offered a great advantage for the construction of graving docks in the port, which he recommended. The author also advocated the extension of piers and engineering works for ship accommodation in the haven, his reasons being that the estuary, from geographical position, as well as for other important reasons, was admirably adapted for a large import and export commerce. The author then described, by the aid of drawings, the new iron pier at Newton Noyes, which runs out from the mainland into deep water. It is provided with three lines of rails, and is connected with the Great Western Railway at Milford Haven Station by means of a short line running along the north side of the Haven near the foreshore. The main portion of this pier is 600ft. long and 50ft. wide, supported on four rows of wrought-iron piles in 20ft. bays. At the outer end an L-piece is built at right angles to the main portion, measuring 180ft. in length, and being of the same construction as the other part. The pier is provided with hydraulic hoists, cranes, capstans, &c., and has every arrangement for the convenience of the mercantile marine. The mechanical, arrangements connected with these works were carried out by the author under Mr. Bower, the contractor and lessee of the pier.

Light Railways.—One of the provisions of the Regulation of Railways Act, passed last session, hardly appears, as the *Railway News* observes, to have received the attention its importance merits. We allude to the granting of facilities for the construction of light railways, by obviating the necessity of costly applications to Parliament for private bills, a power of authorisation being vested in the Board of Trade. The following are the clauses referred to:—" 27.—The Board of Trade may, by license, authorise a company applying for it to construct and work, or to work as a light railway, the whole or any part of a railway which the company has power to construct and work. 28.—A light railway shall be constructed and worked subject to such conditions and regulations as the Board of Trade may from time to time impose or make; provided that (1) the regulations respecting the weight of locomotive engines, carriages, and vehicles, to be used on such railway, shall not authorise a greater weight than eight tons to be brought upon the rails by one pair of wheels; (2) the regulations respecting the speed of trains shall not authorise a rate of speed exceeding at any time twenty-five miles an hour." Considering the great value of railway communication to the agricultural and trading interests, it is much to be desired that a network of cheap auxiliary lines should be laid throughout the country, affording the local accommodation which the great trunk lines cannot be expected to provide. Most of the short branch lines of existing railways, particularly in agricultural districts, are so unremunerative. and such a dead weight to the companies working them, that there certainly will be very few more of such railways built. A much cheaper style of construction and working must in future be adopted for branch lines, if they are to be made profitable, and landowners and local interests will do well to undertake a work in which railway companies for some time will be slow to take the initiative. The great landowners particularly might be expected to give all the assistance in their power towards the construction of cheap lines, which would soon repay their cost in addition to the value of property, while railway companies will be willing to give every encouragement to what would prove important feeders of traffic. The facilities granted by the Act referred to removes all difficulties from the establishment of a widespread system of auxiliary lines, and with such hopeful examples as the Festiniog before us, local enterprise must indeed be dead in any district that remains cut off from railway communication. These views have been very ably expressed by Mr. Henry S. Ellis, who, in a paper read before the Exeter Chamber of Commerce, gave the particulars of a line in Buckinghamshire, constructed on the Duke of Buckingham's property, running from the Quainton-road Station of the Aylesbury and Buckingham Railway to the village of Brill, with a branch to Wootton—in all, about seven miles. The country traversed is entirely agricultural, and the line, following closely the surface of the ground, has been constructed at a cost of £1,400 per mile. The line returns between 13 and 14 per cent. on the outlay.

The Institution of Civil Engineers.—The first weekly meeting of this Society for the session 1872-3 was held on Tuesday the 12th inst., Mr. Hawksley, President, in the chair. At this meeting the names of thirty candidates, who will be balloted for on the 3rd prox., were announced, including three Members and twenty-seven Associates. A report was brought up from the Council, stating that they had, under the provisions of the bye-laws, transferred Mr. G. Hardinge, M.A., from the class of Associate to that of Member; also that the following candidates had been admitted Students of the Institution, viz.: Messrs. James Gordon Brickenden, John Shanks Brodie, William Westlake Cadman, Henry Davy, James Richard Fletcher, John Alfred Griffiths, Charles Hastings Mackie, Frank Salter, B. Sc., William Elvin Sant, William Harry Scriven, Edwin James White, and John Hamilton Wicksteed. The discussion upon Professor Abel's paper on "Explosive agents applied to Industrial Purposes" was continued throughout the evening, and not having been concluded, it was announced that it would be resumed at the meeting on Tuesday, the 19th inst.

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BOOKS RECEIVED.

Manual of Buhl-Work and Marquetry, with Designs, by W. Bemrose, Jun. (London: Bemrose & Son), is intended for the guidance of amateurs. The directions are clear as far as they go, but not much can be said for the designs.—*Life of Richard Trevithick*, by Francis Trevithick,. C.E. (London: E. & F. N. Spon), Vol. II., is, like its predecessor, full of information, but so badly arranged as to deter any one not immediately interested from attempting to read it.—*Strength of Materials and Structures*, by John Anderson, C.E., LL.D., F.R.S.E. (London: Longmans), is another of the valuable "Text Books of Science," now being published by Messrs. Longmans. The name of the author is a sufficient guarantee of the effective manner in which his subject has been treated. The treatise is divided into two parts—the strength of materials as depending on their quality, and the strength of structures depending on the form and arrangement of their parts, and on the materials of which they are constructed.—*The Civil Service Arithmetic*, by R. Johnston, new edition (London: Longmans), is tolerably well known—as are most of the author's educational works—by Civil Service candidates. Some of the papers set in recent examinations enhance the value of the present edition.—*The Royal Guide to the London Charities for* 1872-3, by H. Fry, tenth annual edition (London: R. Hardwicke), is too well known to need more than mention. In his conduct of the "Guide" during its ten years' existence the editor has, of course, had opportunities for observation of the work done by the London charities, and in a preface to the present issue he points out that one of the most remarkable features of the past ten years' history has been the rapid increase in the number of convalescent hospitals. He also adds some suggestions for the more thorough organisation and co-operation of the various societies, with the view to the more complete relief of the really poor, and the detection and punishment of the professional mendicant.—*A First Book of Mining and Quarrying* (London: Lockwood & Co.) is said to be intended to meet the want experienced by teachers of the young in mineral districts of a book giving a general outline of the industries of such districts in a simple manner. If it does this it does nothing more, and seems hardly worthy of a place in the well-known Weale's series, of which it forms a part.

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Blaby Union Chapel was reopened on Tuesday week, after rebuilding at a cost of £270, from designs by Mr. Macaulay, architect.

At a meeting of the Committee of the Lincoln Diocesan Architectural Society on Friday week, Mr. Fowler's design for the new tower of Sixhills Church was generally approved.

Building Intelligence.

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CHURCHES AND CHAPELS.

Avoch.—A new Presbyterian Church is in course of erection at Avoch, N.B. It is in the form of a parallelogram, and is arranged to contain 400 sittings. The walls are of stone, of a reddish-brown colour, with freestone finishings. The interior is finished with red pine throughout, the roof being supported by arched principal couples resting on corbels of stone, and boarded for slates. A gallery extends across the west end, and the pulpit is placed at the east end. The seats are open benches with ornamental ends. The windows are of stained glass throughout. The church is being carried out from the drawings of Mr. Alexander Ross, architect, Inverness.

Brighton.—The foundation stone of the new Church of S. Martin, Brighton, was laid on Monday. The building is from the design of Mr. Somers Clarke, Jun. The building will be constructed of the yellow bricks of the neighbourhood, with red brick arches, window-heads, and strings. The church will seat 1,169 persons. The contract for carrying out the work, minus the tower above the roof line, is taken by Mr. Jabez Reynolds for £11,500.

Church Gresley.—The ancient parish church at Church Gresley was reopened on the 5th inst., after partial restoration. A large new chancel has been added, and the whole of the interior of the fabric has been entirely renovated. The old box pews have been swept away, and comfortable sittings of a modern character substituted. The work has been done by Mr. G. Lilley, of Ashby-de-la-Zouch, Mr. A. W. Blomfield, of London, being the architect.

Glasgow.—The foundation stone of a new United Presbyterian Church was laid at Glasgow on Friday last. The building is in the Gothic style, and is constructed so that a spire may be added, if required. It is about 70ft. square, exclusive of the session-house, vestry, &c., which abut on the east side. The building is estimated to accommodate 1,100 persons, and will cost about £5,000.

Holbeach.—On Friday week opening services of Union Chapel were celebrated. The building is in the Romanesque style of architecture, and is divided internally into nave and aisles by two rows of iron columns supporting semicircular arches. Over the arches is a clerestory lighted by semi-headed windowing arranged in couplets. The material for the walling is white Whittlesey brick and Bath stone. The front of the chapel has a gabled centre, containing in its upper stage a three-light semi-headed window, with detached shafts and moulded arches, and in the lower stage five semi-headed windows. The chapel, when the end gallery is added, will seat about 350 persons; and attached to it is a schoolroom, vestry, and out-buildings. The contract for the building has been executed by Mr. Chappell, of Holbeach. The architect is Mr. Tait, of Leicester.

Liverpool.—On Thursday week the memorial stone of a new Methodist chapel was laid in Grove-street, Liverpool. The cost will be £6,500. The style of the building will be Lombardic; the principal features of the elevation to Grove-street being a tower and spire at the north angle of the building, with an entrance doorway to the church, vestries, and gallery. The height of the tower and spire will be 85ft. The principal entrance will be at the south angle of the building, under a stone portico, supported on columns, with carved caps. The church will be lighted with five large circular-headed mullion windows on each side, besides three large windows in the gallery floor, of back elevation. The elevation to Grove-street, tower, and portico, will be faced with Yorkshire shoddies, and the dressings to the doors, windows, cornices, &c., will be of Stourton stone. The interior of the church is to be divided into three bays by the iron columns supporting the gallery beams being continued up to the roof timbers. The roof is to be flat, formed into panels. The centre bay will be 34ft. high from the floor of the church, and the side bays over the galleries 28ft. Accommodation will be provided for 900 persons. The size of the church is—width, 67ft. by 48ft. 8in., inside, and across the transept 54ft. 5in. wide. In the basement of the building is a large school-room, 55ft. 6in. by 48ft. 3in., and across the transept 53ft., and 13ft. 6in. high. The contract for the building is £5,130, and the works are being carried out by Messrs. Litt & Wilkinson, builders, Bootle, from the plans of Mr. W. I. Mason, architect.

Quarndon.—The foundation stone of a new church at Quarndon was laid by Lady Scarsdale on Tuesday week. The site is beautifully situate at the top of Quarndon, adjoining the new schools, and when erected the edifice will be seen for many miles round. It will consist of nave, two side aisles, chancel, with organ chamber and vestry, tower, and spire. The extreme length of the building is 82ft., and width 50ft. The height of tower and spire to the top of the vane will be 80ft; the height from floor to ridge will be 40ft. The tower will be placed at the south-west angle, near to the high road. The entrance to the church will be through a porch of the right side. The vestry will be on the same side, having a separate entrance; beneath will be the vault for heating furnace. The land slopes very much towards the east-end, so that under the chancel, &c., will be space for storage, if required. Under the floors will be arches throughout. The nave roof is to be supported on each side by a series of stone moulded arches with labels on stone columns, and will be formed with frame principals and purlins; the spaces between showing as panels, boarded and moulded, all being exposed to view. The chancel roof is to be boarded under the timbers, and divided into panels by moulded ribs and carved bosses at the intersections. The roofs to aisles correspond with that of the nave. All the roofs are to be covered with Westmoreland slates. The sittings will be open benches placed on raised wood floors, and the aisles paved with ornamental tiles. Accommodation is provided for 360 persons. The style of Gothic adopted is that which prevailed in the latter part of the fourteenth century. The design was prepared by Messrs. Giles & Brookhouse, architects, and the works are being carried out under their direction by Mr. Edwin Thompson, contractor, all of Derby.

Sibdon.—The parish church of Sibdon was reopened on Tuesday week, after restoration. The alterations have been carried out under the superintendence of Mr. Nicholson, of Hereford, and the church is seated to accommodate about 100 worshippers. The cost of the restoration is about £600.

Staunton.—The parish church of Staunton was reopened on Sunday week. Mr. W. H. Hugall was the architect. The new works include new roofs to the nave and south aisle, the plaster which had so long hidden the old timber in the ceiling of the latter having been removed. The ancient south transept has been entirely rebuilt.

Wandsworth-Road.—A new Baptist chapel is in course of erection at the corner of Victoria-road, Wandsworth-road. The exterior is faced with white Burham bricks, enlivened with bands of red bricks. There are two towers in front, 12ft. square, and 50ft. high, used for the purpose of ventilation. The entrance will be by a flight of stone steps into a porch formed by ornamental brick columns, and variegated brick arches. The roof is open timbered, the timbers being supported by circular ribs springing from ornamental iron columns. The chapel is being built by Mr. W. Higgs, of Vauxhall, from designs furnished by Mr. W. Higgs, Jun., architect.

Winchester.—The Church of S. Maurice, Winchester, has undergone alterations and improvements internally during the past few weeks, the contractor being Mr. E. Carter. The alterations include the removal and some slight repairs to the organ, which now occupies a position in the eastern end of the southern aisle. The whole of the pews have been replaced with benches, the reading desk has been moved, and the pulpit lowered, whilst the eastern wall over the communion table has been decorated in polychrome and stencil, the design carried out being by Messrs. Cox & Son, of Southampton-street. The chancel will be paved with encaustic tiles, and the entire cost will be £800.

BUILDINGS.

Broxburn.—The memorial stone of a new public hall and Working Men's Institute was laid at Broxburn, N.B., on Friday last. The erection will be a simple oblong building, with Gothic details. The architect is Mr. James Fairley, Edinburgh.

Driffield.—At the usual fortnightly meeting of the Driffield School Board, held on Thursday week, the following tenders were received for the erection of the schools, including fittings, &c :—Messrs. Bretherick, Gage, & Co., Norton and Driffield, £5,396 16s.; J. F. Shepherdson, Driffield, £4,795; J. Brown, York, £4,695; Thos. Foster & Son, Driffield, £4,645; Thos. Teal Dickinson, Driffield, £4,626 15s. 6d; Joseph Berry, Driffield, £4,580; Hewson, Brothers, Driffield, £4,566 6s. 6d.; the tender of Messrs. Hewson, Brothers being accepted. On the motion of the chairman, seconded by Mr. Wrangham, it was agreed to make application to the Public Works Loan Commissioners for a loan of £5,800, for defraying the cost of the building and incidental expenses that might arise thereon. The cost of the building, as estimated by Mr. Paull, the architect, was £4,723.

Liverpool.—Compton House, Liverpool, is about to be converted into an hotel, from designs by Messrs. Culshaw & Sumners, of that town. The ground floor will be so divided as to form four shops, and the whole of the remaining floors will be devoted to the purposes of the hotel. The scheme contemplates the formation of a grand vestibule in the centre of the present building, which will be quite distinct from the lower floors, and will be used exclusively by the visitors. The upper stories will be devoted to dormitories, with the exception of the fifth story, on which all the culinary arrangements will be carried out.

Middleton.—The directors of the Union Bank of Manchester a few years ago purchased some property in the Market-place, Middleton, and in it established one of these branch banks, subsequently altering and re-adapting the premises, to make them more convenient. These improvements (which have recently been completed) have been necessarily slow, owing to the contract having to be carried out in sections, so as not to interfere with the banking business, which was continued in the building. The alterations consisted principally in removing the lower portion of the elevation fronting the Market-place, and substituting in its stead a dado of Yorkshire Pierpoint stone, having a moulded cornice, that also forms the sill for an arcade of windows above, and which have columns, caps, label mould, and arches (with semi-circular intrados and pointed extrados) of polished Yorkshire stone. The various improvements have been designed and supervised by Mr. James Redford, F.R.I.B.A., of Manchester; and have been satisfactorily carried out by Mr. John Grundy, stonemason, as general contractor; with Messrs. Turner for carpenters and joiners; Mr. Ogden, bricklayer; Mr. Dean, plumber, glazier, &c.; and Mr. Fitzgerald, plasterer; all of whom belong to the district.

Saltburn-by-the Sea.—The new Convalescent Home, Saltburn-by-the Sea, has been completed. The family of Pease, whose name has now become a household word in South Durham and the North Riding of Yorkshire, and whose works and workmen are scattered throughout various portions of these counties, have not only been at the entire cost of the new building, amounting to upwards of £12,000, but will also be at the entire expense of its continued maintenance for the injured and sick amongst their workpeople. For some time past the patients have been located in premises in the neighbourhood, which, having been found much too small, an eligible site was purchased from the Saltburn Improvement Company. The services of Mr. Thomas Oliver, F.R.I.B.A., of Newcastle, having been secured, and a design adopted, somewhat after the celebrated convalescent home at Vincennes, a contract was entered into in 1870, and the works have been regularly pushed forward since that time. The site selected is on an elevated situation, with easy approaches to the sea beach, and the building, which is of a somewhat plain and substantial character, depends for effect more upon its bold outline of gables, roofs, and chimneys, together with the colour of the different materials used, in conjunction with the cool gray sea skyline, than upon its mere architectural pretentions. The style of architecture adopted is domestic Gothic, freely treated, and the materials employed throughout are white brick, with warm cream coloured stone dressings. Green Westmoreland slates have been used for the whole of the roofs, and the ridges are finished a deep red colour. The chimneys, which have ventilating flues attached, are boldly treated in groups. The frontage of the building is about 200ft. long; the building itself is formed in two parallel lines reaching about 100ft. from front to back, the front line being appropriated to kitchen offices, washhouse, laundry, and such like purposes. To secure warmness and dryness the whole of the walls have been built hollow; the floors of the corridors are of coloured tiles by Minton, Hollins, & Co., while the floors of the dormitories, day rooms, and sick wards are laid with pitch pine; the staircases are all of stone. Accommodation is provided for fifty patients. The warming is secured by open fireplaces, with gill backs, which supply warm air from openings in front of the grate; and the ventilation is secured by means of these stoves, as well as by Sherringham valves for the inlet of fresh air and ventilating flues in connection with the fire-flues and the outlet of the foul air. Messrs. Robson & Son, of Darlington, were the sole contractors for the building works, and Messrs. Walker & Emley, of Newcastle, for the engineering works. The sub-contractors were as follows:—For the carpenters' and joiners' work, Messrs. Bridges & Robson, of Hartlepool; for the plumbers' and gasfitters' work, Mr. Johnson, of Darlington; for the plasterers' work, Mr. Ormerod, of Carlisle; for the ironfounders' work, Messrs. Walker & Emley, of Newcastle; for the painters' and glaziers' work, Mr. T. C. Tomkins, of Saltburn. Mr. R. Robinson, of Darlington, was clerk of the works

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requesst that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the Building News School Planning Competition is extended to the 30th of November, 1872. For particulars, see Building News, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

Received.—A. H. B.—T. W. H.—A. C.—W. G. B.—J. B. W.—Purifier.—J. A. B.—E. M. & Co.—A. L. G.—W. A.—J. N.—S. Bros. & Co.—A. B. C.—Two Architect's Assistants.—T. A. G.—J. H. W.

Alex. Ross.—The photos. to hand.

W. Allen Dixon.—The small photo. to hand. Should like to see drawing.

Attention.—It is probably a local motto.

F. E.—Your letter on architects' assistants is too insipid for our columns.

Q. B. P.—Not in our line. Ask through the *English Mechanic*.

Frank Beale (Builder and General Contractor, Andover) has sent us a puffing paragraph about the restoration of Andover Congregational Chapel. It appears that he has made "quite a model interior" of it. "The work has been executed in first-class style, by Mr. Frank Beale, builder," "who also prepared the plans and specifications; and it is but justice to say that it has been carried out with great judgment and skill." Mr. Frank Beale must be a man of versatile ability. He can prepare plans for the restoration of a Congregational church, so as to make it "quite a model interior;" he can execute the work "with great judgment and skill;" and he can beat the ordinary penny-a-liner in describing what he has done.

S. S. Stallwood.—The drawing to hand.

One Intended for the Profession.—Specify more definitely what information you require through Intercommunication.

E. P. G.—Too late.

◆

Correspondence.

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THE PRESENT POSITION OF ARCHITECTS' ASSISTANTS.

To the Editor of the Building News.

Sir,—I am glad to see this matter is likely to be thoroughly gone into, as it concerns the welfare of such a large class of the profession. It appears to me that the best way of satisfactorily settling it would be for the London and other architectural associations, to whom we look for professional guidance, to appoint a committee, which, in communication with the Royal Institute of British Architects, should fully investigate the matter, and place it on a firm and just basis. It is evident, even to outsiders, that the present position of architects' assistants is a very unenviable one. In comparison with clerks in businesses, &c., our pay is ridiculously small, and when one considers the range of scientific and artistic training a good assistant has to get through, involving a considerable expenditure of money and much study, which clerks in businesses do not concern themselves at all with, I think that architects' assistants are most unfairly and unjustly paid, and that the Royal Institute of British Architects, together with all other architectural associations professing to promote the well-being of the architectural profession, as well as architecture, should co-operate in redressing this evil. Of course, in paying assistants better it would be necessary to know that one assistant is more competent than another; testimonials give very little information on this point, and, as a class, are very shaky things to trust. To assist in discriminating between good, bad, and indifferent assistants, the examinations held by the R.I.B.A. are very valuable as far as they go, but it appears to me that if some alterations could be made in them they would become much more valuable and effectual. At present, the examinations for the Class of Proficiency are held in London only; this does not give a country assistant much chance of availing himself of them, for few country assistants would, or could, afford (with their present salaries) to travel 250 miles to London, pay examination fee, and the expense of a fortnight's residence there, and journey back with, perhaps, after all, the chance of failing by a few marks. Could not the examinations be made to resemble in some sort the examinations held by the Department of Science and Art, and be held in every town in which any members of the R.I.B.A. reside, by means of written papers of questions transmitted from the R.I.B.A. (provided, of course, that application has been made from those towns for examination), which papers of questions should be so framed as to cover more ground than at present, so as to admit of the examiners placing passed candidates in three or more standards? In this manner a candidate could be examined in the town in which he resides, or one not far off, and have the chance of passing in either of the standards from the same questions, which papers of questions could easily be transmitted to London, to be there examined, after which candidates should be informed in which standard they have passed, or if they have failed altogether.

Not very many assistants would give themselves the trouble and expense of passing these examinations if there was not some inducement of a better position in the future held out to them if they passed, and I would therefore suggest that the members of the R.I.B.A. should pledge themselves in future to take a passed candidate as an assistant in preference to one who has not passed, and to pay him a salary varying with the standard in which he has passed. By these means, I believe the position of assistants would be very much improved, and we should not then find, as now, really good assistants working for the same salaries as others greatly their inferiors. The pay of assistants who had not passed would then become lower than at present, but, on the other hand, that of passed assistants would rise, and a species of winnowing begin which would tend to drive out of the profession assistants who would not, or could not pass, and thus architecture, encumbered with these "dead loads" no more, would progress with renewed spirit and vigour, being urged onward by a highly trained brotherhood of workers zealous for her welfare.—I am, &c.

A Country Assistant.

Sir,—It has afforded me much pleasure to see your columns opened to a discussion on the above subject, and I would venture to put a few queries as points for discussion. I would ask, are we not ourselves to blame in not asserting our just rights? Do we not humiliate ourselves by asking comparatively small salaries for work—brain work—which cannot be done by mere mechanical draughtsmen? Do not assistants generally who become practising architects, immediately they commence their practice, secure pupils and their premiums as numerously as possible, and, indeed, employ, in many cases, inefficient but cheap draughtsmen, perhaps some ambitious outsider "who has a taste for drawing," and gets his paltry sum in consideration of picking up what few crumbs may fall to his lot from the study of his employer's work? Also do not our leading employers, by their example, influence the whole system, to the injury of the qualified articled assistant; and do not we all know of cases in which gentlemen of education and means are allowed to give their time (which time, by the way, they hardly know how to spend) in offices of architects who are at the top of the tree in the eyes of the public? Moreover, do we not quietly submit to these intrusions, and in our turn, if the present system do not change, will we not reap similar fruits for ourselves? I firmly believe your correspondent "W. S." has asserted the opinion of our whole body, when he says that the blame attaches itself to our "leading architects."

It is possible that the bitter memory of enduring and suffering in their former capacity of assistant architects spurs them on till they find themselves "doing to others as they have been done by," and, if this be so, can they be expected to deal out even-handed justice to their (shall we say?) unfortunate brethren—pardon me, *employés!* Again, can we out of our present salaries afford to buy those necessary helps in the way of books; or find means to travel here and there (as I maintain we ought) to "study from the life," so to speak, those examples of our art which are as our very meat and drink? We, as assistant architects, cannot possibly make headway, or even keep pace with the rapid progress made in other professions. Surely something is wrong in this state of things!

Is it possible that we assistants are behind our fellow men in the matter of industry? I would answer certainly not! For I believe, as a rule (and I take my own observation as a guide), that architectural assistants work, study, and plod as much as, if not more than, the students of other professions; and correspondingly I have found them patient under small remuneration, enduring slights, and indeed in some cases positive insults, from their favoured employers, which the merest hand-to-mouth labourer would resist unflinchingly. Nay! I believe we will very soon have no social status at all, if we do not take some bold, manly course to convince our employers of our determination to have justice done. Surely, we are not so apathetic as to fear taking some decided and united action in this matter. I think not! But if this discussion should fall through before any definite resolution is arrived at, then I should say "Farewell hope!" we must plod on, lower and lower in the scale, trusting some kind ray of light in the way of practice may illumine our otherwise sombre path—welcome, if it only scare away for a time the darkness of actual despair.—I am, &c.,

I. S. B.

Sir,—I most heartily hope that now the payment of architects' assistants has received some attention in the columns of your journal, we shall have a little more consideration given us than is at present accorded by our masters. I have no doubt a great many have, like myself, given their £150 or £200 premium, expecting to learn a profession at which they may, when the term of their articles expires, be able to earn at least a comfortable living. Now I am sure it is very different; masters when they cannot obtain a high premium with a pupil, and do not care to pay an assistant, will accept perhaps £20 from one in a more humble situation, paying him from four to nine shillings per week. Thus, there are many who cannot obtain a situation in consequence of there being so many candidates by this means, and any one who would be entirely dependent upon his exertions for a living would far better have chosen to be a factory man—as regards payment. In fact, an association of some kind is most essential, and architects would then find that their ill-paid assistants could not be done without, and that to live themselves they must give their assistants sufficient salary to live in a better manner than they do at present. All other professions—I can hardly believe it is one—are far better paid than ours, and an assistant, unless he be a perfect encyclopædia of his profession at a very early age, had far better be dead than alive. Trusting other assistants will come in a body to the pages of our sympathiser, the Building News, and pour out their troubles, I am, &c.,

A Groaning Pupil.

CRAGSIDE.

Sir,—The well-deserved encomium which you last week, and also on previous occasions, bestowed on Mr. R. Norman Shaw, will, I think, be echoed by the profession at large. More especially deserving is that tribute of admiration when we remember that the style which Mr. Shaw has chosen—viz., part stone and part timber construction—is the most difficult, of all styles, of a successful artistic treatment. Hence very few architects indeed are found to adopt that style, except in such toy-like structures as entrance lodges, gardeners' cottages, &c. Although, for reasons of economy and other causes, that method of construction is not likely to be to any great extent the style of the future, yet there are certain features of Mr. Shaw's designs which the profession would do well to imitate. I refer to the chimney stacks. It would be difficult to invent anything more hideous than the cowls and other marvellously ingenious structures which disfigure the skylines of nearly all modern buildings. The cost of those deformities is sometimes considerable, but the annoyance of the smoky chimney is sufficient to blind the owner to all the excellences of the design, especially if comfort may have been sacrificed for effect. Now, the great fault in modern flues is that they are too small, and not carried sufficiently high into the air. A flue, 9in. by 9in., carried a few inches above the ridge, is generally deemed sufficient, but sooner or later the inevitable cowl or pot appears. I do not know what reasons induced Mr. Shaw to design those picturesque chimney stacks, which contribute very much indeed to the grouping and outline of his buildings, but from the height which they are carried into the air they are likely to prevent the nuisance of a smoky chimney. In a building of the last century, which I have lately remodelled, the flues were 18in. by 12in., and the chimney throats enormously large, all in interior walls, in which the draught was always excellent, without the use of the cowl or the pot.—I am, &c.,

H.

SCOTLAND.

Sir,—The left bank of the river Tay has of late years undergone a decided change, and certainly a very great improvement. Instead of, as a few years ago, the bank being studded with old and ruinous tenements, small orchard patches, &c., gradually sloping down to the water's edge, a very substantial wall has been brought up from the bed of the river to the level of High-street, and the slope been made up; and the street, which will constitute one of the most enjoyable drives and promenades of our fair city, is at present being macadamized. On its side already stands some of the best specimens of street architecture of which our city can boast, including the new Free Church (S. John's), lately erected by that congregation, at a cost of about £10,000, from the drawings of Mr. John Honeyman, Jun., architect, Glasgow. A block of a very superior kind has also been erected from the drawings of Mr. Andrew Heiton, architect, Perth, for the proprietor, Samuel Cowan, Esq., of the *Perthshire Advertiser*, and which new block will consist of premises for the publication of the said paper, the Government offices of the city, law and other offices, the third story being divided off into flats. Other buildings are in course of erection, and before long another decided feature will be added to this city.—I am, &c.,

Perth, Nov. 6. J. F.

A PLEA FOR BUILDERS' CLERKS.

Sir,—It has long been a mystery to me that builders' clerks are content with receiving the low rate of remuneration paid them, and that nothing has been done for their benefit, except in Manchester, where the long hours have been shortened. As operatives in all branches of the building trade have either had some concession granted them as to working hours or increase of wages, I am surprised that builders' clerks should not stir themselves to improve their position, and get the office hours, which are very much too long, altered from 6 to 6 to (say) 9 o'clock to 5.30. The salary paid clerks in Birmingham and neighbouring towns is only equal to the wages that a navvy can earn, viz., 25s. per week, and less than a good bricklayer or carpenter gets; a few clerks who get 30s. consider it a good salary. Now, taking into consideration that a builder's clerk must have had an expensive education, and that he has much longer hours to work than an architect's assistant, and has often to perform exactly the same work, in making plans, taking out quantities, and estimating, and that there are more intricate and varied calculations in the building trade than any other, I think most unprejudiced persons will allow that our office hours are too long, and that we are inadequately remunerated for our services.

By reason of their paying such low salaries builders frequently experience losses from embezzlement by their clerks, and the blame is mostly attributable to the builders themselves, as they ought not to expect integrity and ability for a mere nominal salary.

Hoping to hear the opinion of other clerks on this subject, and that you will kindly allow me space for this in your next issue, I am, &c.,

A Builder's Clerk.

GOTHIC FURNITURE.

Sir,—You have recently published various illustrations of furniture in the "so-called" Mediæval style. As your good taste in artistic matters is fully recognised by all who read your paper, and as you do not venture to eulogise these productions, I suppose I may safely infer that they are given as warnings of what should be avoided. At the same time, it is puzzling to understand why architects should take the trouble to produce designs for furniture, and too often for buildings also, which are evidently based on the harshest, crudest, baldest, most angular and least interesting forms they can select, and that the details and ornaments, if they can be so called, should partake of the same character; also, that they should so restrict themselves to a wearisome repetition of notches and stop chamfers, almost always as angular and ungraceful as the general outlines.

When will designers understand that wood is a material susceptible of receiving the most delicate curves and mouldings, the most intricate and beautiful surface-ornament, as well as the boldest relieved work, and that it requires only good and artistic taste to apply these agreeably; that there is no special artistic merit in kitchen-dressers and plate-racks, rabbit-hutches or washerwomen's clothes' horses, packing-cases, &c., which seem to be the inspiring "motifs" of our modern designers. Not only is this absence of elegance, grace, and beauty sought for, but we are presented with sections, plans, and details, to enable others to reproduce these abortions, though there is apparently no more need of such plans than there would be for a three-legged stool, or a butcher's block, with which these productions are about on a par in artistic treatment.

I appeal to your readers, professional or otherwise, whether they do not know at the first glance that modern Mediæval furniture, as at present rendered, is both mean and ugly to the most intense and painful degree. There is no necessity to run into the other extreme of "rococo" extravagance, as we did fifty years ago, or less, to obtain well designed furniture; nor is there anything unconstructional in the introduction of sufficient curved lines, mouldings, and ornament to secure beauty. If this is ever the case it arises from want of ability in the designer. A very little study of old examples will show how much enrichment can be used without in any way concealing, or even modifying, construction; designers may learn also how long straight lines were usually relieved by curved or running patterns of great beauty, not by senseless notches; how curved constructional lines were usually free from enrichment beyond delicate and appropriate mouldings, and how the miserable pegs that do duty for shafts in modern work and are utterly unappropriate in wood work, except where it assimilates to stone, were entirely eschewed. In fact, the lavish and senseless use of small shafts, and the exclusion or degradation of mouldings, is the bane of modern design. In old furniture the ruling principle of ornament appears to be that it is used to harmonise and soften the hardness of constructive lines. In modern furniture these are emphasized, and being already painfully harsh the result is as bad as it is possible to make it. The remarks I have made will apply to ecclesiastical as well as to domestic furniture. It is only necessary to compare the fittings of a fifteenth century church with almost any modern one to feel how mean and crude is all the woodwork of the latter, not only from its contempt of appropriate form and decoration, but in the poverty of its framing and the flimsiness of its material.—I am, &c., E. W. C.

ANOTHER SKETCH-BOOK.

Sir,—There is, it appears to me, little doubt that good reason exists for starting such a sketch-book as suggested in your last numbers. In the hope that one may be set on foot, I venture to make a few remarks. There can hardly be a doubt that measured drawings are far more useful than mere sketches, but the object of all sketching for the architect being to educate his hand for design, it follows that a cymagraph should only be used afterwards as a test of the correctness of what has been already sketched and measured. The use of such an instrument in the place of sketching mouldings must act on the hand; like that of the camera lucida on ordinary sketching, rendering it weak and unready in design. Besides, I would rather depend even for correctness on a moulding measured and sketched by one who understands how to do so, than on any taken by a cymagraph.

In regard to setting aside a certain subject for a certain time, a sketch-book should be useful for reference, and to be so it is necessary that there should be a certain class of subjects only admitted. Any one period, however, is sufficient to fill volumes and volumes alone, besides encouraging the idea, now only too prevalent, that good work is to be found in one date more than another. I would, however, suggest that some one feature, such as doorways, fonts, woodwork, house fittings, &c., be chosen, and any date admitted. I think arcades would not be a bad one to begin with, as it is a subject of which everybody must have dozens of examples measured, and a book containing nothing but these, with their mouldings, would be very valuable. I see no reason why foreign as well as English work should not be admitted.

The contributors to lithograph their own drawings, or, if for photo.-lithography, drawing in Morrell's writing ink is almost preferable to Indian ink, as every line is equally dark.—I am, &c., F. C. D.

CARLISLE LIBERALITY.

Sir,—I herewith forward you another instance of the more advanced stage competitions have arrived at in the north. You will observe that no premium is offered, and no guarantee that the successful architect may be allowed to carry out the work on the usual terms. With respect to the amount allowed for these extensive premises, the sum is totally inadequate, and will simply be, in the end, a repetition of the Chorley Town Hall Competition. I trust the profession may be able to withhold from this tempting bait:—

Carlisle Public Hall Company.—Particulars for Architects.—The front of the building to be of white brick, with stone facings. The sides to be of good plain machine-made bricks, and the whole of the brickwork to be solid and substantial. The front to comprise two shops, with principal entrance between the shops, and the building to contain the necessary offices and retiring-rooms, custodians' dwelling-rooms, kitchen, &c. The main hall to be constructed to seat with comfort 2,000 persons, exclusive of the space required for the stage, or platform, and to be suitable for large meetings, concerts, balls, theatrical entertainments, &c., and easily convertible into a hippodrome or circus. It must be built upon the newest and most approved acoustic principles, and great care must be taken to secure perfect ventilation and freedom from draughts. There must be a gallery all round, or at one end, at discretion. There must also be a small hall, suitable for meetings, sales, small assemblies, &c., constructed to accommodate 500 persons. The front portion of the building must be cellared, also the small hall. The total cost of the entire building not to exceed £4,500.—Charles Syme, Hon. Sec., 1, English-street, Carlisle, November, 1862.

Durham. George Ord.

CITY ARCHITECTURE.

Sir,—Some discussions have taken place of late respecting the unpopularity of the profession. When I saw you some time since, I expressed wonder at the terribly inartistic effect of new London street architecture, and, truly, if City architects are not unpopular, they ought to be. Looking at the vast influence which London must have on architecture generally, I believe that city architects, in a very great measure, are to blame for this unpopularity, and I think that a rattling good article or two on that subject would be of immense advantage. Mr. Godwin, in continuation of his series, may, with advantage, take up the City architect, who, generally, can neither scratch, sketch, nor draw—that part of the profession, with them, is left to the chief clerk or peripatetic draughtsman.—I am, &c.,

J. H.

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LEGAL INTELLIGENCE.

An Architect Non-suited.—Daniels v. Griffiths.—Mr. J. Daniels, architect, Crickhowell, summoned the Rev. Arthur Griffiths, rector of Llanelly, in the Tredegar County Court, for a sum of £42, value of plans and specifications prepared for the church recently erected in Brynmawr. The plaintiff was instructed by defendant to prepare plans and specifications prepared for the erection of a church at Brynmawr on the site of the old one, which was blown down; he was to take all the *debris* and value it, and settle what could be made use of in building the new church; he prepared five drawings, all of which refer to the same plan; and delivered them to defendant at his private residence; the order was given at Brynmawr; he charged 1½ per cent. for preparing the plans, including the expense of sundry journeys to survey the ground and call upon defendant; the curate was present at Maes-y-Gwartha when he received instructions from defendant about advertising for tenders; the building was to cost £1,200; defendant said he would lay the estimate before the committee; plaintiff had delayed taking proceedings because defendant asked him to wait the result of an offer of a piece of ground which had been made by the Duke of Beaufort.—Mr. E. J. C. Davies, said: He was a member of the Building Committee, and he attended one meeting in 1866; he believed he volunteered to speak to Mr. Daniels about the affair, and told him, if he liked to send in plans, &c., he would do his best to get him the contract. His plans were rejected, and as far as he (Mr. Davies) could recollect, it was understood that Mr. Daniels was to run the chance of his plans succeeding. The defendant and his witnesses having been examined, the judge decided the plaintiff had failed to establish his case, and a non-suit was accepted.

[The advertisement for tenders for the erection of this church inserted in this journal in October, 1867, has never yet been paid for. We have been referred by the Rev. A. Griffiths to the Building Committee for payment and have applied, but have never been able to obtain the amount.—Ed. B.N.]

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WATER SUPPLY AND SANITARY MATTERS.

Cheltenham Sewage Farm.—The sewage of the town of Cheltenham, after passing through tanks, where the solid matter is precipitated, flows by gravitation over a farm of 127 acres, about three miles from the town, which has been purchased for the purpose by the Town Commissioners. This farm is divided into seven lots, and is yearly let by auction, it being a condition that the sewage liquid shall be applied in the discretion of the borough surveyor, under whose management the irrigation works are placed. With the exception of one lot of six acres the farm is ordinary pasture ground, the excepted field being laid down with rye grass. The third annual letting of the farm was held on Thursday last, and a very large company attended the auction. Lot 1, of 26a. 3r. 20p., was let at £5 10s. per acre, the price last year having been £6 6s. Lot 2, of 17a. 3r., was let at £6 7s. 6d. per acre, as against £6 6s. last year. Lot 3, 22a. 2r., was let at £6 15s. per acre, the same price as last year. Lot 4, 8a. 1r., was let at £7 an acre, as against £6 16s. last year. Lot 5, 24a., let last year at £7 an acre, was knocked down at the same price this year to the same tenant. Lot 6, 21a. 1r. 20p., was let at £5 12s. 6d., as against £5 15s. last year. Lot 7, 6a. 1r., the only portion of the farm laid down with rye grass, was let at £9 an acre, as against £9 15s. last year. The total result of the letting was £815 1s. 6d. for the year. The pasture land was let subject to the condition that it be mown not more than twice during the year; the rye grass land was subject to no such restriction. The cost of the farm to the town of Cheltenham, with the necessary irrigation works, was about £18,000. Such part of the liquid sewage as is not required on the farm is supplied to neighbouring farmers at a charge of 15s. per acre.

Southsea.—A conference was held last week at the Pier Hotel, Southsea, for the purpose of discussing the practicability and desirability of introducing carbon into the purification and utilisation of sewage, by means of a system invented by Mr. Edward C. C. Stanford, F.C.S. Colonel Synge, R.E., entered into an elaborate exposition of the main features of the system, and an interesting discussion ensued. The "carbon system" is now being tried at Glasgow.

Intercommunication.

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QUESTIONS.

[2691.]—**School Ventilation.**—There used to be a ragged school somewhere in Westminster most efficiently and simply ventilated by means of a pump. Can some one inform me what school this was, and if at present existing; and if not, how the pump worked? Could it not be rendered self-acting by means of a small windmill or fan at the top of the building?—A. J. H.

[2692.]—**Liability of District Surveyor.**—I should be glad if any of your readers can inform me whether a district surveyor is not liable under the following circumstances: A whole row of houses have been built (I have no doubt by a speculating builder) with two flues in each party wall connected with those of the adjoining houses, and the party walls have not been carried up to the height required by the Building Act, so as to allow the gutters to deliver from one house to the other. This is in the metropolitan district, and it seems to me either that the Act is of no use or that the surveyors don't do their duty.—A. A. A.

[2693.]—**Weight of Masonry.**—Can any one inform me, after obtaining the nett weight of the several stones used in a piece of masonry, what allowance, if any, should be made for mortar used in setting to determine the actual weight a girder beneath is to support?—C. G. A.

[2694.]—**Valuations and Arbitrations.**—Can any of the readers of the Building News inform me as to the best books extant on valuations of land and buildings, wherein examples are worked out showing the fundamental principles and the explanation of "years' purchase"? Also, the best book on arbitrations, giving examples.—R. S. T.

REPLIES.

[2665 & 2680.]—**Measuring Chimney Stacks.**—In further reply on this subject, I always consider it the best and safest plan to calculate the value of any kind of difficult work, that is not in the ordinary course of prices, by taking the nett cost of all materials, and then calculate the labour required. If a bricklayer can lay 1,000 bricks in a day at an ordinary plain job, he ought to lay 500 in one that was rather difficult, making all extra allowances for scaffolding, &c. Again, there is generally one-half difference in the real value of workmanship, so that it is impossible to say what would be the value of a chimney stack, &c., without some basis to go on, the higher the stack and the more expensive the labour. If you know the measurement of the stack, with the thickness of the walls at top and bottom, the size, quality, and price of bricks and mortar (if built of bricks), you may soon ascertain the cost of the materials, and then calculate the labour by superficial yard of the total length and girth, after which an estimate may be formed in any way, either by superficial "face measurement" by cubic yard, or lump sum. By the way, I see "M." does not know what a "superficial yard is." It contains 9 square feet (in the county of Cumberland), and is the standard measurement in the north for nearly all kinds of work in the building line except hewing. There very much wants one universal system of measurement laid down for our guidance. This is a matter that should be taken up by the Institute of British Architects.—Rusticus, Cumberland.

[2678.]—**Centrolinead.**—"O. X." is advised to consult Nicholson's "Practical Builder," he will there see for himself the method of setting the centrolinead. —D.

[2679.]—**Hoop-Iron Bond in Mortar Joint.**—I venture to suggest that "S. P." may have misread the article, and that the bond referred to is "bond timber," and not "hoop-iron bond." The former is, no doubt, injurious, as the wood is liable to both shrinkage and rot; but if the iron hooping be previously tarred, to prevent rust, I have never heard it abused. Hoop-iron bond is being most extensively used in the gigantic walls inclosing the various basins and docks in the Chatham Dockyard Extension Works, and if the bond were an agent of destruction I think it most improbable that it would be used in those works.—J. T. J.

[2688.]—**Drainage.**—"R. H. W." does not give a very accurate description of his drainage, or one might give him more particulars. Eighteen inches of fall would be considered a nice thing in many localities if you had sufficient depth for your drainage before. Nothing requires ventilating more than drains (our ale cask won't run long without "spiling"), and if "R.H.W." would build a small air-shaft to stand two or three feet above ground at some convenient place near the high end of his main drain, which, if properly made, and the supply plentiful, would soon run as near full as possible. The grating on the top should be such as would keep vermin out of the drain. A main drain is like the foundation of a building. Be sure it is good and ample before leaving, as the whole depends on it after. Many drainers make a great mistake with putting in too small mains. As all drains draw most at first, in good draining land it is not a bad plan to put the shank drains well apart, so that in a few years you might put another drain between them. Much depends on the nature of tiles for drawing—a soft and porous tile drawing most—as generally the water should percolate through the sides of the tile. I should be glad to have the question on the Drainage Act, qy. 2672, p. 314, answered.—Rusticus, Cumberland.

Our Office Table.

PAPERS TO BE READ BEFORE THE ARCHITECTURAL ASSOCIATION OF LONDON.—This (Friday) evening, Mr. T. Roger Smith will lecture "On Professional Practice." The syllabus of papers for the remainder of the session is as follows:—November 29, Prize Essay, by the author; December 13, "History Illustrated by Stained Glass, and Exemplified in the Windows of Long Melford Church, Suffolk," by Mr. Charles Baily: January 10, 1873, a paper by Professor Kerr; January 24, "Teachings of Some Old Churches in Northants," by Mr. John Sulman, A.R.I.B.A. February 7, a paper by Mr. R. Herbert Carpenter, A.R.I.B.A.; February 21, Members' Soirée; March 7, "Middle Class Schools for Girls," by Mr. E. C. Robins, F.R.I.B.A.; March 21, "Coloured Decoration," by Mr. G. Aitchison, B.A., F.R.I.B.A.; April 4, "Dilapidations," by Mr. Banister Fletcher, A.R.I.B.A.; April 18, "The Palace of Scaurus," by Mr. R. Phené Spiers, A.R.I.B.A.; May 2, a discussion will be opened by Mr. T. Blashill, A.R.I.B.A.; May 16, "On Taste in Colour," by Mr. D. W. Wynfield; May 30, "On Altars," by Mr. F. T. Dollman, A.R.I.B.A.; June 13, "The Popular Estimate of Architecture," by Mr. F. Chambers, F.R.I.B.A.; June 27, "On Italian Decoration," by Mr. E. C. Lee, A.R.I.B.A.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—At the first meeting of the Council, recently held at No. 9, Conduit-street, Capt. J. Britten, R.S.M., was elected chairman, and T. R. S. Temple, Esq., M.A., deputy chairman for the session 1873. It was announced that Mr. George Browning, honorary secretary, who will arrive in England in a few days, has done much during his tour in Italy and France to develope the system of foreign correspondence on matters of fine art proposed by the Council of the society.

LECTURES ON PROFESSIONAL PRACTICE.—Mr. T. Roger Smith has undertaken to deliver a course of six lectures on "Professional Practice," under the auspices of the Architectural Association. These lectures will be open to all members of the Association. The first lecture of the series will be given this (Friday) evening, and the remaining lectures will be delivered on the following Monday evenings—November 25, December 9, December 30, January 13, and January 27. We hope to publish reports of all these lectures, which will, we have no doubt, be of great practical use to the young architect.

EDINBURGH AND LEITH ENGINEERS' SOCIETY.—The first meeting of this society for the session was held on Wednesday week, Mr. Alan Brebner, C.E., President, in the chair. After a few brief introductory remarks by the President, a paper was read by Mr. Buchanan, C.E., on the Water Works at Crieff, lately constructed by him. The writer stated, as one peculiarity of these works, the great height (1138ft. above the sea level) of the loch from which the water is taken. It is conveyed by means of a pipe along the hill side for about three miles, then across a valley to the town reservoir by an inverted syphon, the lower part of which is 900ft. below the level of the loch. The cost of the whole works is about £5,000, and the rental available for taxation upwards of £12,000. With the aid of certain private subscriptions the rate will not be more than 4d. in the pound. The novel use of the equilibrium valve employed to check the supply to the town caused considerable discussion among the members of the society.

THE CLERKSHIP TO THE BOARD OF WORKS.—At the meeting of the Metropolitan Board of Works on Friday last the appointment of a successor to Mr. Pollard, the late Clerk of the Board, was considered. There were two candidates, both gentlemen already in the employment of the Board, Mr. Wakefield and Mr. Delahooke. The Works Committee recommended the appointment of Mr. Wakefield, the senior officer, who during Mr. Pollard's illness had discharged the duties of clerk, and who has been in the service of the Board and of the bodies which previously administered the local government of London for twenty-four years. The question of salary was also settled. Mr. Pollard had originally been appointed at a salary of £100 a year, which was increased gradually to £1,000 a year—a sum fixed in 1868 as the maximum salary of the clerk. In consideration of the fact that the duties attached to the clerkship are heavier now than they were when Mr. Pollard was first appointed, Mr. Wakefield's salary commences at £500.

TECHNICAL EDUCATION IN THE CITY.—The distribution of the prizes awarded by the master, wardens, and court of assistants of the Worshipful Company of Turners to workmen or apprentices in England who have sent in the best specimens of hand-turning took place on Thursday week in the Egyptian Hall, Mansion House. The Lord Mayor presided. The competition for this year was in turning in hardened and tempered steel, the subject being horological turning. Mr. F. O. Smithers (Master of the Turners' Company) said that it was entirely due to the Lord Mayor that the company had been able to go forward as they had done. Other civic guilds had followed the example of the Turners' Company, and two previous Lord Mayors had supported the movement. The British Horological Society had also given great assistance in the movement. A most marvellous piece of turning by a woman had been sent in, but too late for competition; and he intended to ask the court to confer a special mark of distinction upon this work. The judges in the competition were Sir John Brown, Mr. John Jones, and Mr. Samuel Jackson, and they had awarded the first prize (a silver medal, together with the freedom of the Company and of the City) to Mr. Lewis Donne for a chronometer balance staff and rollers; the second prize (a bronze medal) to Mr. H. J. Mann, for a similar specimen of work on a larger scale; and the third prize (a certificate of honour) to Thos. A. Nelson, an apprentice, aged 18. After addresses had been made by Mr. John Jones and Mr. S. Jackson, treasurer of the British Horological Society, the Lord Mayor presented the successful competitors with the prizes they had won.

READING ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—The last general meeting of the present session took place on Wednesday evening, the 6th inst., at the Athenæum, Friar-street, Reading. The President, Charles Smith, Esq., was in the chair. The accounts presented by the treasurer showed a satisfactory balance in hand. After some general business had been transacted, the president proceeded to review the work of the session, during which it appears that thirteen general meetings have been held, at which papers have been read on a great variety of subjects, whilst during the summer excursions were made by the society to Sonning, Shottesbrooke, and White Waltham Churches. At the close of the meeting, Joseph Morris, Esq., was elected president for the ensuing session, which will commence almost immediately, the Rev. Lewin G. Maine and Mr. Fred. W. Albury being elected vice-presidents, and Mr. E. J. Shrewsbury the hon. secretary.

THE PALESTINE EXPLORATION FUND.—The committee of the Palestine Exploration Fund have just received a first instalment of the work of surveying the Holy Land. It consists of the first three sheets of an ordnance map of the country, on the scale of one inch to a mile, based on an accurate trigonometrical survey, and containing all the modern names of streams, hamlets, villages, and ruins, as well as a careful delineation of all the valleys and mountain ranges. The three sheets include the districts between Jaffa and Jerusalem, and the country north of Jerusalem towards Nablous, and embrace an area of 560 square miles. The survey has been already completed over an area of about 1,000 square miles, and further sheets may be expected about the beginning of the new year.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (to-morrow).—ROYAL ARCHITECTURAL MUSEUM.—"On the Early English and Early Decorated (Early First and Second or Middle Pointed) Ornament Casts in the Museum." By Mr. William Brindley. (Admission free.) 3.15 p.m.

MONDAY.—ROYAL INSTITUTE OF BRITISH ARCHITECTS. — "On Professional Esprit de Corps," by Mr. T. Roger Smith, F.R.I.B.A. 8 p.m.

TUESDAY.—INSTITUTION OF CIVIL ENGINEERS.—Renewed discussion upon Mr. Abel's paper "On Explosive Agents Applied to Industrial Purposes." 8 p.m.

WEDNESDAY.—SOCIETY OF ARTS.—Opening address, and presentation of the Prince Consort's prize and medals awarded during the last session, by Major-General F. Eardley Wilmot, R.A., F.R.S., Chairman of Council. 8 p.m.

FRIDAY.—ARCHITECTURAL ASSOCIATION.—Meeting of the Class of Construction and Practice, 6.30 p.m.; subject, "Excavator and Bricklayer;" Visitor for the evening, Mr. Lacy W. Ridge.—Meeting of the Class of Design, 8 p.m.; subject, "Artist's Studio, Detached."

SATURDAY.—ROYAL ARCHITECTURAL MUSEUM.—"On the Decorated and Perpendicular (Second or Middle and Third Pointed) Ornament Casts in the Museum." Mr. William Brindley. (Admission free.) 3.15 p.m.

Trade News.

WAGES MOVEMENT.

BIRMINGHAM.—Last week the Builders' Association issued notices to the effect that the working hours for all branches of the trade, both in the workshops and out of doors, on and after Monday, November 11, until February 18, 1873, would be from seven a.m. to five p.m. On Saturday last the bricklayers inserted an advertisement in the local papers, in which it was stated that the masters, if they enforced the rule set forth in the notice they had issued, would be acting contrary to the rules as decided by Mr. Rupert Kettle. The carpenters and joiners also dissent from the masters' notices, and they in an advertisement stated their conviction that Mr. Rupert Kettle's rules did not provide for the hours as decided upon by the masters. They contend that Mr. Kettle decided that the working hours of carpenters and joiners, both in-door and out-door workmen, should be from six a.m. to five p.m. on each of the first five working days in the week in the summer months, with one hour and a half allowed for meals—viz., half-an-hour for breakfast, and one hour for dinner; and on Saturdays from six a.m. to one p.m., with half-an-hour allowed for breakfast. In the winter months—that is to say, for a period comprising six weeks before and six weeks after Christmas—the regulations were to be essentially different. The in-door workmen were to keep exactly the same hours as in the summer; but the out-door men were to commence at seven a.m., and work till five p.m., having, however, only half-an-hour allowed for dinner. Thus, the out-door men would make half-an-hour less working time per day than the in-door men. The wages of out-door and in-door men were, however, to be exactly the same—the out-door men, they consider, being entitled to the pay for the extra half-hour in consequence of the discomforts they have to endure in bad weather. These regulations, the men contend, were clearly laid down by Mr. Kettle. On the other hand, the masters rule that nothing of the sort was intended, but that Mr. Kettle intended, during the twelve weeks in the winter, that both in and out-door workers should labour from seven a.m. to five p.m. only, and that the men should be paid only for the hours that they worked, without any allowance whatever. On Monday, notwithstanding the notices issued by the employers, the men went to the works at the ordinary time, six o'clock, but at three firms the doors were found to be locked. The men thereupon left the premises and returned to their homes, none of them having been to work since. On Tuesday afternoon a conference of the employers and a deputation of the men was held. After a long discussion, in the course of which several of the men contended that they had rightly interpreted the meaning of the rule, and the masters took a contrary view, it was resolved that Mr. Rupert Kettle should be asked to define the true meaning of the disputed rule. Mr. Bloore was selected as the representative of the employers, and Messrs. Laughton and Waldron as those of the men, and it was resolved that these three gentlemen should proceed to Wolverhampton last evening and lay the matter before Mr. Kettle, asking him to give his decision as quickly as possible. Meanwhile the men will resume work upon the old conditions.

THE POTTERIES.—To the great relief of the district, the operative potters of Staffordshire have withdrawn their demand for payment on "good from hand" instead of "good from oven." Had the demand been persisted in a general lock-out would have taken place at the end of the present week, in which case from 25,000 to 30,000 would have been deprived of employment. The men were strengthened in this demand by the fact that the leading house of Minton & Co. had consented to pay on good from hand; but, with this exception, the whole of the manufacturers were perfectly unanimous in their demand to resist to the last extremity the radical change in the customs of the trade which would have been involved in acceding to the demand mentioned. The annual hiring this Martinmas is, apart from this dispute, proceeding less satisfactorily than usual, but both sides are prepared to submit all minor disputes to the decision of the local board of arbitration.

BIRMINGHAM.—A large meeting of brassworkers was held on Tuesday night at Birmingham, at which it was resolved that the workmen employed in several branches of the trade should give notice on Friday and Saturday next to leave work, in consequence of their employers not recognising their demands for an advance of 15 per cent. in their wages.

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TENDERS.

Bow Common.—For the erection of schools in S. Paul's-road, Bow Common, E., for the School Board for London. Messrs. R. Phené Spiers & Henry Hall, architects. Quantities by Mr. L. C. Riddett:—

Longmire & Burge	£9989
Nixon & Son	9977
Brass	9940
Webster	9925
Higgs	9876
Pritchard	9777
Perry & Co.	9458
Cooke & Green	9402
Nightingale	8999

Driffield.—For the erection of the Driffield Board Schools. Mr. H. J. Paull, architect, Manchester. Quantities supplied:—

Brethirick, Gage, & Co.	£5396
Shepherdson	4795
Brown	4695
Foster & Son	4645
Dickenson	5625
Berry	4580
Hewson Brothers (accepted)	4566

Hatcham.—The tender of Peto Brothers, for £7,494, was omitted from the list last week.

London.—For the decoration of State Rooms and other works at the Mansion House:—

Morant, Boyd, & Blanford	£5050
Trollope & Sons	3758
Gillow & Co. (accepted)	3526

London.—For alterations on ground-floor of No. 23, Finsbury-place, London, for the Universal Fire Insurance Company. Mr. J. H. Rowley, architect. Quantities not supplied:—

Rivett	£183	0	0
Minchin	163	0	0
Vaughan	153	0	0
Boyce	138	0	0
Wagner	106	10	0

London.—For the erection of vaults and foundations for the Gresham Life Society, Poultry, London, E.C. Mr. J. J. Cole, architect. Quantities by Mr. Barnett:—

Trollope	£4247
Browne & Robinson	4074
Henshaw	3685
King & Son	3520
Perry & Co.	3353

London.—For the erection of stabling and loose boxes for the London General Omnibus Company, at Harrow-road, Paddington, under the superintendence of Mr. Tosh:

Blake & Ramplen	£1384
Wood	1283
Pink	1230
Allen	1197
Heath	1170
Markham	1148
Carter	1145
Gaston	1145
Bishop	1145
Capps & Co.	1088
Mark	1070
Gilson	1047
Thompson	1037
Wall	1014
Holms	985
Blease	983
Garrod	983
Ashburt	975
Badman	975
Beach	949
Wilson	898
Robins & Co.	889

Marylebone.—For sewer works in Seymour-street, &c., S. Marylebone. Mr. T. G. Browning, Chief Surveyor:—

Wall	£6200	0	0
Stevens	5930	0	0
Marshall	5719	0	0
Bridgman, Nuthall, & West	5197	0	0
Pearson	4759	0	0
Vickers & Crane	4675	0	0
Hubbard	4577	0	0
Hoare & Son	4470	0	0
Wigmore	4350	0	0
J. & S. Williams	4190	0	0
Crocket	3995	0	0
Potter	3700	0	0
Pizzey	3499	10	0
Neave & Son (accepted)	3498	0	0
Killingback	3094	0	0
Haynes	3020	0	0

Middlesex.—For alterations at "The Castle" Hotel, Finchley-road, Child's-hill, for Mr. Randle. Mr. George Stooke, architect:—

Cottle	£145	10	0
Cook	145	0	0
Levey	145	0	0
Stovel	128	0	0
Heath (accepted)	122	10	0

	For Pewtering.	Allow for old Pewter.
Rich	£68 17 6	£14 4 6
Richards	63 17 6	10 0 0
Heath	52 0 0	—
Cottle	56 10 0	10 0 0
Wright	53 10 0	11 0 0
Cox (accepted)	51 0 0	10 0 0

Millwall.—For the erection of schools in West Ferry-road, for the School Board for London. Mr. R. Phené Spiers, architect. Quantities by Mr L. C. Riddett:—

Sheffield	£7393
Cooper	6750
Crockett	6699
Scrivener & White	6690
Brass	6595
Higgs	6550
Browne & Robinson	6528
Cooke & Green	6389
Hill & Son	6340
Pritchard	6293
Killby	6285
Mansbridge	6070

Portmadoc.—For the erection of a smithy, for Mr. R. Jones. Messrs. Roberts & Morrow, architects:—

R. Griffith	£210
Hughes	200
O. Griffith	189

Staines.—For the erection of a detached residence. Mr. Robert J. Worley, architect:—

	£	Without attics. £
Wright Brothers & Goodchild	2520	2390
Guest	2400	2300
Spearing	2300	2174
Lyons	2350	2070
Turrell	2160	2080
Boden	2010	1890

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Do.	do.	12 by 7	1 18 6	13s.
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Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

Carlisle Public Hall Company, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

Chester Union, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

Chichester, November 27.—For plans and specifications for the conversion and reconstruction of the West Sussex Company's premises in East-street into a club house.—Mr. E. G. Raper, Secretary, West-street, Chichester.

Llanelly School Board, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £3 per head. A premium of £15 will be paid for the plan approved of.—Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

The Carlisle Diocesan Church Extension Society, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Aberystwith, December 2.—For re-flagging or asphalting the footpaths of the town.—Mr. W. H. Thomas, Town Clerk, Aberystwith.

Admiralty (Whitehall), November 26.—For supplying H. M. Dockyards with chain for rigging, cranes, &c.—Mr. F. W. Rowsell, Superintendent of Contracts.

Admiralty (Whitehall), November 28.—For the supply of tin canisters.—Mr. F. W. Rowsell, Director of Contracts.

Belfast, November 20.—For the construction of about 23,540ft. of brick sewers, with street gulleys, sewer entrances, ventilating shafts, &c.—Mr. J. Guthrie, Town Clerk, Town Hall, Belfast.

Bermondsey, November 18.—For the supply of 10,000ft super best 2½in. tooled York paving.—Mr. B. G. Wilkinson, Clerk to the Vestry, Maltly-street.

Birmingham, November 21.—For repairs to the cemetery buildings.—Edwin John Hayes, town clerk, Town Clerk's Office, Temple-row, Birmingham.

Bombay Street Tramways, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

Bradford, November 25.—For the erection of 23 houses on the Shipley Fields Estate, Frizinghall.—Messrs. Hope & Jardine, architects, Exchange Buildings, Bradford.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

Canterbury, December 2.—For a concession of the town sewage.—Mr. R. W. Flint, Town Clerk, Castle-street, Canterbury.

Cardiff, November 27.—For the construction of a sewer on the western side of the River Taff.—G. Salmon, clerk, Town Hall, Cardiff.

Cardiff, November 27.—For scavenging and watering the district in two divisions for three years.—G. Salmon, clerk, Town Hall, Cardiff.

Commissioners of Sewers, November 22.—For the purchase of a quantity of old paving stone.—Mr. J. Daw, Principal Clerk, Sewers Office, Guildhall.

Eccleshill, November 18.—For the erection of a detached house.—Mr. S. Firth, Architect, Undercliffe.

Failsworth Local Board, November 21.—For the construction of certain works of cross sewering, paving, flagging, &c., in Mill lane, Failsworth.—Mr. Trapp, Engineer to the Board, 88, Nosley-street, Manchester.

Great Wigston School Board, November 22.—For the erection of a school to accommodate 300 children.—Mr. H. A. Owston, Chairman to the School Board, Friar-lane, Leicester.

Haverfordwest, December 16.—For the erection of boys', girls', and infant schools, outbuildings, and boundary walls. Also master's and mistress's residences, &c., to be built at Prendergast.—Michael White, Clerk to the Board, Haverfordwest.

Heaton Estate (near Bolton), November 18.—For the construction of a new road about 50 chains in length.—Mr. R. Smith, Deane Cottage, Bolton.

Ireland, December 14.—For alterations and additions to Aughrane Castle, near Ballygaar, County Galway.—Mr. Kempster, Architect, Ballinasloe.

Leeds, November 21.—For the erection of engine house, boiler house, and other buildings for brick-making in Armley-road.—Wilson & Bailey, architects, Central Market-buildings, Leeds.

Leominster, November 21.—For the erection of class-rooms for the National Schools.—Mr. E. Lloyd, Solicitor, Leominster.

Metropolitan Board of Works, November 21.—For the construction of 908ft. of brick sewers, with iron pipe, and other works in connection therewith.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens.

Midland Railway, November 18.—For the supply of chains, iron, copper, brass, tin, and various other stores.—Mr. J. Williams, Secretary, Derby.

Midland Railway, November 19.—For the erection of machine office and weighbridge foundations at South Tottenham.—Secretary, Way and Works Committee, Midland Railway, Derby.

Morecombe, November 21.—For the construction of 1,000 lineal yards of brick sewers.—Mr. John Bond, Surveyor, Morecombe.

North Eastern Railway, December 12.—For the erection of a goods and grain warehouse at Kingston-street, Hull.—Mr. Prosser, architect, York.

North Eastern Railway, December 12.—For the erection of a goods and grain warehouse at Lime Kiln Creek, Hull.—Mr. Prosser, architect, York.

North London Railway Company, December 3.—For the supply of 300 tons of house coal.—Mr R. S. Mansel, Secretary, Euston Station, N.W.

S. Luke's (Middlesex), November 18.—For the purchase of an iron building standing in S. Thomas's Burial Ground, Golden-lane.—Mr. W. W. Hayne, Vestry Offices, City-road.

S. Luke's, Millwall, November 25.—For the erection of a parsonage and schools.—Messrs. Hooper & Lewis, architects, Millwall.

Sheffield, December 5.—For the construction of about 9¾ miles of street tramways.—John Yeomans, Town Clerk, Sheffield.

Southport, December 3.—For the erection of a new public building in Lord-street.—Messrs. Maxwell & Tuke, Architects, Bury.

Teddington, November 18.—For finishing four houses. Specification to be seen at the Roebuck, Hampton-road, Teddington.

The Great Northern Railway.—Bradford, Eccleshill, and Idle, and Idle and Shipley Railways.—(First Contract) Osset and Dewsbury Railway, December 9.—For the construction of passenger station, platforms, waiting shed, and goods warehouse, at Earlsheaton, and large fireproof goods warehouse, offices, entrance gates, and weighbridges, cottages, &c., at Dewsbury. (Second Contract).—For the construction of passenger stations, platforms, waiting sheds, &c., at Eccleshill and Idle. And goods shed, coke stage, engine pits, crane, weighbridges, and other works at Shipley.—Mr. J. Fraser, Engineer, 19, York-place, Leeds.

War Department Contracts, November 26.—For the performance of works and repairs to War Department buildings at Sunderland and Tynemouth.—Royal Engineer Office, 12, Princess-street, Cornbrook, Manchester.

Woolwich Union, November 21.—For the engineering works at the new infirmary adjoining the workhouse.—Mr. S. Brough-Sargent, Clerk to the Guardians, Union Offices, Plumstead.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 22, 1872.

THE WORKMAN'S SHARE IN ARCHITECTURE.—II.

What it Is.

WE made some remarks three weeks ago on the extent to which the architecture of the Middle Ages was designed by individual workmen, and tried to investigate the subject by internal evidence from Mediæval buildings themselves. This evidence, far from showing that every workman designed his own bit of wall or vault or roof as he went on, proves, to something little short of mathematical demonstration, that his first and most essential duty was to carry out the ideas of the head designer. This understood, the further question arose whether he was capable, in a smaller way, of designing anything for himself. Many men—perhaps, most men—have no such capacity, or have it only in some rudimentary and abortive shape. For these, the only course was to do what they were fit for, to become merely mechanical workmen of one or another class. For the man, however, who had artistic talent, who held within him some thoughts, however few, which would enrich the work on which all were engaged, a career was provided. He, indeed, like every one else, had to do his share in carrying out the general scheme; he had to work as a subordinate, and to put into shape the inventions of another; but still in the minor details of this design he had liberty; a place was found him in which his own imagination might be exercised, and a larger and yet larger place, as he deserved it better. He was not by any means a wholly independent designer, unless, as the last reward of much diligent work, he became the architect or master mason to a larger or smaller structure; but in a rank which, from the necessity of things was a secondary one, he had liberty of design within rigidly defined limits. Thus, the actual share of the individual workman in architecture, as deduced from Mediæval works, turns out to be very different from the imaginary control over it which has been attributed to him by fanciful writers. He was one actor in a drama, and according to his talent he had a more or less important part assigned him. According to his talent, too, he might act this part in a dull mechanical way, or in a spirited and original one; he might even put so much of his own thought and invention into it that he could be said, so to speak, to have "created" the part; but, strictly and accurately, he no more created it than Garrick created Hamlet, or Mrs. Siddons Lady Macbeth. The creator of each and every part was, by necessity, the creator of the whole drama: the unknown Shakespeare who put his thoughts into a building instead of a book, and found his way to men's hearts by their eyes instead of their ears.

The grand difficulty in modern times, then, is the getting intelligent actors. This is where the architectural drama at present fails; and if any one doubts it, we refer him to the cases—not rare in church building—where Mediæval compositions have been almost literally copied. More lifeless productions, as a rule, cannot be found, and the lifelessness, unquestionably, is due to the workmen. The general conception (whether suitable or not for modern purposes) is the same which delights us elsewhere by its beauty; the design, or main scheme of the structure, looks, perhaps almost faultless in the model we are repeating, and yet, in our neat and careful imitation, we have managed to lose its whole spirit and essence. It is the difference between Shakespeare represented by Garrick and Mrs. Siddons, and Shakespeare represented by a company of amateurs. The fault is not in the author, but in the performers; and the remedy is not to discard the former, but to educate the latter. At the present moment it is one of the hardest things in the world for an architect to find workmen who will do their work with interest and intelligence. It may not be altogether or chiefly the fault of the workmen, but the fact is what we have stated. The difficulty may be traceable to the existence of a bad system, or to the want of a good one, but here it is, and it is of no use to ignore it. Suppose, for instance, there is such a simple thing to be done as the painting of a wall or a piece of woodwork, in two or three colours. If the workman had a fraction of the intelligence and judgment which years of experience ought to have given him, the architect could settle with him, in a very few words, the general character of the tints desired, and leave him with the confidence that he would select them so as to harmonise. As matters now are, this would usually be little short of recklessness; the least an architect can do is to make a careful drawing showing all the colours required, and even this is not enough unless he stands by and sees them mixed. Make a pattern and leave it, and the chances are it will not be matched within a dozen shades. If you indicate, for instance, some one of the innumerable tones of brown or gray, you may calculate with confidence on not finding the former represented by ultramarine, or the latter by vermilion; but much nearer the mark than this the average house-painter does not trouble himself to go. He can make broad distinctions, but he does not stoop to trifles, and if he comes within a dozen shades of the pattern thinks he has managed it pretty well. Of course, the common house-painter (we are not now speaking of professed decorators) is a comparatively unskilled workman, but still there is no reason why he should be ignorant of the very rudiments of his art. The mason's is a much higher class of work, and an architect meets from time to time with many masons whom he cannot but respect for their practical knowledge and their real anxiety to make "a good job" of their building. They are so far in advance of the painter that they do the mechanical part of their business very well, and to do this in a complicated and difficult thing like masonry is no trifle. In fact, the man who is a clever mason gives proof thereby of so much intelligence and capacity that one naturally looks for more, and then, alas! for the most part, is disappointed. As we said before, it is not wholly or principally the mason's fault that it should be so. He has fallen on evil times, and it is his circumstances rather than his nature that have robbed him of the power which his predecessors wielded. Still, the fact remains that though he can execute almost anything that can be put on paper, he can design for himself almost nothing, and hence, where it is necessary that he *should* so design, even to the smallest extent, his work becomes lifeless and insipid. Take, for instance, the decorative mason or carver, whose work cannot be set out by rule and line, but who must do it, as we say, "by eye," that is, by his own judgment and perception of what is excellent. What he does is worthless without this judgment and perception, and yet how rarely does he possess them; and how much more rarely does he possess that invention which will qualify him to add to the interest of a building out of the stores of his own mind. Thus, modern architecture loses in two ways at once; first, from the fact that each example of it only contains the ideas of the head designer, instead of containing these *plus* the ideas of the subordinate designers; and second, from the fact that even the head designer cannot get his ideas adequately and forcibly expressed. We may as well avow at once—what we are very likely to be reminded of—that there are many head designers, in the present state of affairs, who have no ideas worth expressing. True, however, as this is, and often as we have enlarged on it when we have been dealing with the *architect's* share in architecture, we still see that competent designers fit for a subordinate position are more rare in proportion than competent architects. We know, to speak within bounds, of twenty living architects who have produced, as far as general arrangement and composition go, good Gothic buildings; but we do not know of competent carvers and decorators enough, or nearly enough, to undertake the carving and decoration with which those twenty architects have to do.

The wisest course, perhaps, which a really able architect can just now adopt, is to rely as much as possible on general design, and as little as possible on decorative details. Main composition, skyline, and the massing of light and shade, are within his power to regulate; so are mechanically-worked features like mouldings and tracery; and architecture of the grandest type can be produced with simple elements like these. There will be a certain over-severity about it, no doubt, and without sculpture, or figure painting, or carved ornament, it can never reach the highest class of beauty. If, however, these higher arts are unattainable, it is useless to accept mere counterfeits of them; in sober truth, it is worse than useless. The so-called "designer," whose designing now consists in nothing but the providing a box with holes in it for the so-called "carver" to adorn, would find himself forced into something like architecture, if the services of this "carver" were denied him. Even such buildings as those of Queen Victoria-street, if they could once be freed from the trashy ornament which covers them like a cutaneous eruption, would be no longer absolutely repulsive, however ugly. At present, as these and some other specimens of London architecture tempted us to say a short time since, every incompetent mason seems to set up as a carver, and every incompetent architect seems to rely on such a carver to save him. It is a fact, about which any one may satisfy himself by merely keeping his eyes open as he walks through any of our larger towns, that a great part of what passes for external design—especially among the mongrel or "eclectic" school—consists in little beyond the setting up of plenty of freestone in block for the carver to chop into patterns. If the carvers who thus pander by wholesale to a vulgar taste had been, on the contrary, men of real power and cultivated genius, their work, however precious on its own account, would still have been no substitute for architecture; while, being what it is, and serving as an excuse for the absence of all general composition, it is a nuisance which cannot be too soon abated. We do not forget that here and there a genuine bit of carving, fresh and real, sparkles from amidst the rubbish which threatens to crowd it out of sight. We do, though far too rarely, see some scrap of ornament which a clever man evidently invented as well as carved, and invented in such a key, so to speak, that it improves with the building in which it is placed. Happy is the architect who has found such a helper, with thoughts and ability of his own, who knows how to use liberty without abusing it. There is room in the world for a hundred or a thousand times as many, in all branches of art and manufacture; when we get them, if ever we do, we shall be a long stage nearer to equalling the work of the Middle Ages; and till we get them, let us at least resolve that we will have no more to do with their mere deceptive imitations.

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BRIDGE ROADWAYS.—IV.

WHEN bridges are built to carry the traffic of streets, instead of that of country or suburban roads, there are one or two features which at once serve to draw a line of demarcation between them. In the first place, the roadway proper is usually paved, not in the sense understood with respect to the paving of footpaths, in which the paving consists of flags, but in that in which the surface is laid down with "sets," as they are technically termed. These "sets" consist of stones, "hammer-squared;" that is, roughly dressed into the form of a solid 9in. by 6in. Several names are bestowed upon these sets, according to their size and quality. In some localities, more especially in the quarries in the neighbourhood of Leicester, they are called "sovereigns" and "half-sovereigns," accordingly as they are of the full size specified above or of a smaller size, resembling those that are usually put down at the entrance to stables, farm-sheds, and court-yards. Sometimes the roadway of bridges, situated as just described, is constructed of wooden sets, similar in form and size to those of stone. It may be remarked here, *apropos* of roadways, that the wooden paving, as it is termed, is undergoing a very extensive trial in London just now, and may be fairly considered to be tried on its merits. A strip of roadway on this principle has now been laid down for some time in the vicinity of the church of S. Mary-le-Strand, and appears to wear well. There can be no question about the absence of the noise and racket which attends the employment of a stone thoroughfare in the adoption of the wooden road. The only question that remains to be settled is that of durability. It cannot be denied that if a roadway will stand the traffic of London it will stand any traffic that can possibly come upon it, allowing in all cases for reasonable wear and tear. Another distinctive feature to be noticed in bridges, which may be appropriately called street bridges, is that the footpaths are usually paved either with flags or with some description of ornamental tiles. The latter method has been adopted with respect to the footpaths of Westminster Bridge. Regarding the relative merits of these two descriptions of footpaths, we shall have something to say hereafter.

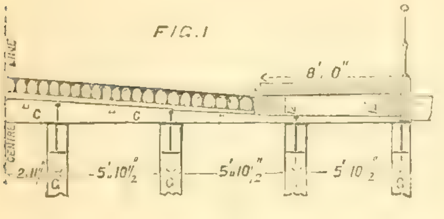
FIG. 1

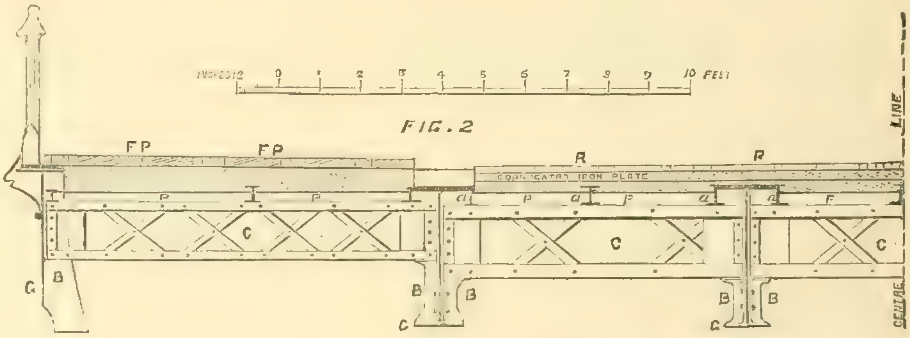
FIG. 2

In Fig. 1 is represented the cross section of the roadway of a bridge erected over the Medway, at the town of Rochester, which is in every sense a street bridge. The principals or main girders G G are composed of cast-iron ribs, spaced as shown in the drawing. These are connected together by cast-iron cross girders C C, which are in separate lengths, each pair of lengths being bolted together by wrought-iron bolts at their junction over each main girder. The roadway is paved with "sets" of granite. A most extensive use was made of sets in paving the Albert Embankment on the Surrey side of the Thames, extending from Westminster Bridge to Vauxhall. The greater portion of these came either from Aberdeen or Guernsey. As a material for roadways, the latter is preferable, as it does not disintegrate so fast as the other. It is not quite so hard, and therefore does not wear with the same rapidity. The footpath in the bridge in Fig. 1 is paved with flags 6in. in thickness. These flags are laid upon a couple of stone bearers 12in. and 11in. respectively in thickness. There is thus a fall of 10in. in the footpath in the width of 8ft. to allow the water to run off into the side channels. It is to be noticed that in Westminster Bridge the footpaths do not drain into the side channels of the roadway, but into others provided for them next to the base of the parapet. The remaining portions of Fig. 1 are self-explanatory.

Having already given sufficient examples of the method of constructing roadways over cast-iron girders, we may now turn our attention to those which are carried upon girders of wrought iron. In Fig. 2 is represented a cross section of half the roadway of Lendal Bridge in the city of York. There is a history connected with the building of this bridge. The design shown in the figure is the second one which was proposed for the same site. It is very different in character from the first, which was a lattice girder. Unluckily, when the former was in course of erection, the staging gave way, and the whole of the structure, temporary and permanent, was carried away into the stream beneath. The authorities, on the occurrence of this mishap, reconsidered the whole bridge question, and the result of their deliberations was the adoption of a new style of erection altogether. Instead of the lattice girder with parallel flanges, which constituted the first design, they selected a design of Mr. Page, which substituted wrought-iron arch ribs for the horizontal lattice girders, a change in an æsthetical point of view decidedly for the better. The main girders are shown in Fig. 2, at G G; to them are bolted the wrought-iron gusset pieces or brackets B B, upon which rest the cross girders C C. These cross beams are small lattice girders, and have the great merit of possessing the features of strength and lightness combined. Upon the cross girders C C are placed the small wrought-iron rolled joists *a a*, and to the lower flange of these are bolted the corrugated iron plates P P. These plates extend the whole way across the bridge, both under the roadway and footpaths. Those under the roadway are $\frac{3}{8}$in. in thickness, and those under the footpaths $\frac{1}{4}$in. A greater degree of strength is obtained by the use of corrugated iron plates beyond that afforded by mere sheet iron. There are, however, two other methods of obtaining a similar, and even a greater, amount of strength. One is by taking a common sheet-iron plate one-sixteenth or $\frac{1}{4}$in. in thickness, and bending it into the form of an arch. If one of these be tested with a weight at the crown, it will be found to carry five tons without any sensible deflection. The other method is to employ buckle plates, which, comparatively speaking, possess enormous strength. Their expense is a great objection to their use, although it is only fair to mention that they have been used in some very large superstructures of bridges—the new Blackfriars Bridge, for example. Their great strength is due partly to their peculiar shape, which is that of a dome, and partly to the manner in which they are manufactured, which is accomplished under excessive pressure. The carriage or roadway R R in Fig. 2 is composed of several layers of material. In the first place, a layer of concrete consisting of cork and bitumen, 3in. in thickness, is placed immediately over the corrugated iron plates. The object of introducing this light substance between the wrought-iron girder and the rest of the road material is to deaden the concussion of passing loads, and distribute them more evenly over the girders. The cork and bitumen evidently act in some measure as absorbers of the effect produced by passing loads. Over this layer is placed another of ordinary cement concrete, composed of gravel and Portland cement, and upon this is laid the granite paving. The footpaths have layers of similarly composed concrete, and a paving of flags 3in. in thickness. For a bridge constituted wholly of wrought iron, this must be considered rather a heavy superstructure in spite of the intermediate layer of cork concrete. Paving stones and York landings have considerable more weight than either wood or asphalte. If durability and efficiency can be obtained, the lighter the roadway and footpaths of a bridge can be made, the more economical the structure. In a road bridge the superstructure constitutes a very important item in the total load which the bridge has to support. In this point it differs from a railway bridge, in which the weight of the roadway itself is a mere trifle compared with that of the loads which pass over it.

ART TREASURES FROM CYPRUS.*

THE Island of Cyprus is one of those points which stand marked in the map of the world as an ancient focus or radiating point of civilisation. The key to the history of the origins and early development of Greek civilisation, Greek forms of worship and of art, is the history of the early movements and contact of races along the coasts and in the coastward islands of the Eastern Mediterranean. The contact of Hellenic settlements with Semitic settlements along those coasts and in those islands, and the relations of the two with aboriginal populations—these constitute for the historical scholar a set of problems the most fascinating, the most important, and the most difficult. Upon these the attention of much of the best modern scholarship has fixed itself, illuminating them bit by bit with results laboriously obtained, and in need of perpetual revision. But there has been one thing always obvious—that for the study of the primitive intercommunication between Greek and Asiatic and Egyptian, Cyprus is the centre of the position. There were other seats of early intercommunication—there was Crete, there was Rhodes, there was Cos, there was Tarsus, at which the Phœnicians, busy carriers as they were, would have brought their own civilisation, and that of the great continental empires with which they traded, into contact with the receptive faculties of men of the Hellenic race. There were all the harbour towns of the Hellenic world proper, to which the Phœnicians pushed their coasting enterprise. But Cyprus, the great island lying not far south of the coast of Cilicia and not far west of the coast of Syria—within sight of Libanus in clear weather—would be the main central meeting point of races. There the Phœnician traders from Sidon would early beach their galleys; there they would set out their wares for sale; there they would colonise and establish a starting-point for more adventurous voyages yet. Thither they would import their gods, their arts, their fashions, and presently those also of the other great sources and destinations of their commerce, the mainland empires of Egypt and Assyria. And so, in fact, we have a hundred witnesses to the fact of Cyprus being largely and early Phœnicianised. Virgil makes the mythic Phœnician Dido tell of her father having ravaged and subdued Cyprus; and there are other notices representing the Phœnicians as masters there before the time of Solomon; say, roughly, ten or twelve centuries at least before Christ. We cannot tell at what date, later than this, the earliest colonists of Hellenic blood planted themselves there. But from the date when they did so, and found the Phœnicians there before them, there continued to exist in the island as rivals two ruling races, one the Phœnician and the other the Hellenic, centred in different cities and to some extent balancing each other in their supremacy over the native population. Who that native Cypriot was by blood, and of what language, is as yet uncertain, although the art of the island hands down a very pronounced type of his physiognomy, which is perpetuated among the people living in the island at this day. And being whoever he was, he belongs to the Oriental rather than to the Greek cycles of ancient history; passing, as tributary, he and his island, with its rival Phœnician and Hellenic ruling races—with only momentary periods of independence for them — under the sovereignty of one or another in succession of the Oriental empires, Egyptian, Assyrian, and finally Persian.

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* From the *Pall Mall Gazette*.

So that, we repeat, for evidences of the early and fertilising inlet of Phœnician, and through the Phœnicians of Assyrian and Egyptian ideas and influences upon the Hellenic mind, as well as for the subsequent perpetuation and embodiment of ideas in which these elements continued in fusion as they continued nowhere else, there should evidently be no place like Cyprus. Get, if got they were to be, a sufficient number of ancient monuments from Cyprus, and therein you must have the best visible and tangible testimonies in aid of that obscure literary testimony which scholarship has so laboriously sought for, and sifted, and pored and conjectured over—you must have the best clue to the primitive modes and forms in which Semitic and Egyptian ideas and arts and types of worship, as conveyed and modified through the Phœnician channels of communication, penetrated and impregnated the receptive faculties of the Greek.

Now such monuments, in any bulk, were long wanting. They are wanting no longer. Several minor finds of antiquities have in recent years been made in Cyprus of a kind to encourage further search. Obscurity rests upon the question of the sites of most of the ancient cities of the island, both the Greek and the Phœnician. But the sites of some have been recognised with certainty, and among them that of Idalium, near the modern Dali, and that of Golgos, near the modern Athieno. Some not unsuccessful excavations had in recent years been made at these and other sites, chiefly by Mr. Lang, Count de Vogue, and General de Cesnola, of the British, French, and American diplomatic services respectively; and some few of their fruits had been acquired for Vienna, for the Louvre, for the British Museum, and for private collections. The characteristic yield of the diggings in Cyprus, besides glass vessels often in a beautiful state of oxydisation and iridescence, has been a particular kind of fictile vase, different from the ordinary Greek or Etruscan, and carrying generally plain patterns of lines and circles, or else elementary birds and animals, in brown on a ground of light earth-colour; and next, statues and statuettes or fragments of them executed in a mixed style, not in marble, but in a calcareous stone common in the island. All previous discoveries of these things in Cyprus have now been thrown into the shade by the American excavator. Where others had found one fragment, he has found tons of fragments. He has ransacked the ancient necropolis of Idalium; he has struck upon a temple full of statues at Golgos, most likely a temple of Aphrodite —Cypris, the goddess of the island—he has struck upon and ransacked that. The result is an immense and surprising collection of statues and statuettes and heads and fragments of them, in the calcareous stone of which we have spoken, archaic vases, oxydised vessels of glass, idols, and votive images and toys and ornaments and lamps in painted terracotta, spear and javelin heads, funereal bandeaux in thin gold, cups and bowls in clay and bronze—every variety of object which the people of an ancient race were accustomed either to dedicate in their temples, or to bury with them in their tombs.

Immense and surprising, we say, in point of number; but the real importance of the collection is for the light which its study has to throw upon the most vexed problems, the problems most in need of just such illumination, in the history of ancient art and religion. What sort of particular problems these are we can only indicate in the roughest and most general way. The two personages of Greek religion whom, in some of their forms at least, the Greek owed most directly to the Phœnician, were Herakles and Aphrodite—Hercules and Venus in the language of Lemprière and ignorance. Cyprus was the seat of all others where the Greek received, learned, and assimilated his knowledge of these two deities. Cypris, the Cyprian or Paphian Aphrodite of the Greeks, retained throughout many of her Oriental characteristics those of the Phœnician Astarte, or of Mylitta. It seems to have been in a temple of this Græco-Phœnician Aphrodite that the mass of the statues and fragments of statues now under consideration were ranged, on pedestals against the walls or in rows down the middle. The great majority of them represent either figures of the god Herakles in one or another archaic and semi-Phœnician form, throwing wholly new light on the mythology of the god, or else figures of priests of Aphrodite, to be recognised as such by the emblem of the dove and other emblems which they carry. There are also other figures and numberless well-preserved heads of priests or gods, some unconjecturable. Every point of their costume, every detail of their conception and representation, has far reaching points of interest in its likeness to or difference from the points and details of similar matters in Egyptian and Assyrian work. Not a head-covering, not a weapon, not a bandeau or wreath, not a bow or quiver, not a lion's skin, or apron or girdle, about which a chapter might not be written. A cursory glance at the multitudes of whole and mutilated figures shows you waves now of Egyptian and now of Assyrian influence passing over types which yet quickly become, at the hands of a different race, something different from either Egyptian or Assyrian, and more variable and animated than either. It is the beginning of experiment and emancipation, the immobile and abstract hieratic types passing into new phases, the Egyptian and Asiatic becoming Greek. There is a point in the progress of the style where these sculptures closely resemble the ordinary examples of the most archaic Greek work found in other places. But though there are examples that run down through all ages from the most primitive till probably the Roman, there are none that closely resemble the Greek work of the central states and noblest ages. Greek art, having germinated here and at other such points of contact with the East, attained its full flower at Athens and elsewhere; the Hellenic genius, once fertilised from the East, developed itself at home. The art of Cyprus, by the days of the Hellenic culmination in the hands of Phidias and his contemporaries and afterwards, is either that of an imitative and third-rate provincial school, or that of an archaic and traditional school; or rather it shows the two schools working side by side. For the old semi-Asiatic conceptions perpetuate themselves in Cyprus long after they have been ennobled or grown out of elsewhere; and so probably do the old fashions of vase moulding and decorating, and the making of household images. So that it is impossible to be sure of the actual age of all these objects, however old they look. Of the vast antiquity of the types to which many of them belong, however, there can be no doubt. Here, out of the tombs of poor citizens buried without any furniture of glass or vases such as the richer carried to their graves, are little rude figures of mounted warriors; here are little hideous Astartes or Mylittas, rudimentary goddesses in burnt clay, in which you may know the germ of later glories, the humble great-grandmothers of the Aphrodites of Cnidos or of Melos. Here are dozens of little popular images of obscure worships; here are toy processions; here are lustral vases, carved or stamped with a dark mixture of mythologies; here are solemn fragments of colossal gods and high priests, with the set smile and the set curls of hair and beard.

Each one of the hasty sentences we have last written points to years of work for scholars in the comparison, investigation, and elucidation of points in the history of ancient art and religion. Here are the new materials which he has most needed to make such work fruitful. And where are these materials going to for their final lodgment? Where indeed? To New York, U.S. America. That seems a strange destination for a collection of antiquities which is not one representative of beautiful or popular forms of Greek or Greco-Roman work, and therefore valuable as the nucleus of a museum of ancient art in a great centre of the New World; but which is one, on the contrary, illustrative of fertilising influences, of primitive and transition types, and of provincial practice, in a special field of Greco-Oriental art, and therefore valuable—nay, invaluable—as the supplement of existing museums in centres of organised scholarship and research. The shipment of these things to New York means simply, for the present at any rate, mystification for the New York gaper, and sea-sickness for the European archæologist. For the most intelligent New Yorker can get but moderate advantage out of the antiquities of this collection taken apart from their historical place in relation to antiquities of other schools and another aspect; and specimens of these last he does not possess, and has little chance of coming by. And, on the other hand, every serious archæologist of Germany, France, or England, occupying himself with the intricate and vital question of the development of some of the Greek out of the Semitic and Egyptian forms of art and worship, will henceforth have inevitably to cross the Atlantic, in pursuit of this collection, to fill up the gaps in his knowledge of the monuments upon which everything hinges.

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ON OLD ART AND NEW ART.*

(*Concluded from p. 283*)

NOW we shall find if we examine this *resume* of the various styles of painting that they are all, with the exception of the higher kind of portraiture, of a comparatively modern invention. They have all come into practice since the end of the sixteenth century, up to which period art rested on that high ground of which I have spoken, being of a purely creative and ideal nature. They are, if you please, developments of that high school, but they develope from a creative to an imitative art; and as the creative necessarily includes the imitative (man being unable to conceive of anything outside his experience of nature), they must be considered to have taken a lower ground. Nor can it be said to be a new ground, for it is not to be supposed that the Florentine and Venetian painters, who painted the landscape of their backgrounds with such exquisite perception of the very essence of its beauty, never painted landscape pure and simple for want of appreciation; it was because they felt it a degradation of their art that it should rely simply on its power of recalling impressions. Titian, indeed, has left us pictures of almost pure landscape; but they rather take the form of studies, and are at most but in the nature of a diversion from his other and more serious work, being painted but occasionally out of the fulness of his delight in the beauty of his native mountain scenery. And so of fruit and flower painting. There was no painter up to the end of the sixteenth century who would not have scorned to sit down to make a picture of a bunch of roses or a plate of peaches. In their beautiful ideal presentations of the infant Christ and His Virgin Mother they could conceive no more delightful manner of enriching their pictures with forms of beauty than by decorating them with garlands of fruit and flowers, and be sure they took as keen a pleasure in painting these most innocent beauties of nature as any still-life painter of the Dutch, French, or English schools. Herein, then, lies the difference between the old and new in art. A work of pure imitation *per se* was a thing unknown up to the end of the sixteenth century; not because it did not occur to the sculptors and painters of the old world to produce such work, but because they rejected it as not worthy of consideration, knowing well that art means a different thing. Modern art—I mean that part of it which is modern in spirit—is content with recalling the impressions which all of us who have a few shreds of poetic sensibility receive from the more obvious beauties of nature, and in rendering what is purely beautiful finds its impression in that school of landscape-painting which has reached perhaps its highest point in some of Turner's best work—its lowest in the mass of still-life, flower, and fruit painting, of which I suppose William Hunt is the most refined and skilful exponent.

With that phase of modern art which deals not with the beauty of nature, but its grossness or inanity, I for the present have nothing to do. . . . . I have said there are two causes for the great difference to be found between ancient and modern art, a noble and an ignoble one. I will begin with the first; and it seems rather startling to say that an idea of a noble kind may also be of a kind to mislead; but it is rather in the application of the idea to art, not in other considerations to which it gives rise, that the idea appears to me a fallacious one, and when I speak of a noble philosophy of art amounting almost to a religion, you cannot remain long under a misapprehension as to whom I mean by the exponent of this philosophy, or the prophet of this religion; the name of Mr. Ruskin cannot fail at once to occur to your minds. It is with no small amount of diffidence, I assure you, and with some misgiving, that I venture to differ from so gifted a writer and thinker, and especially on a point which he would, and indeed does, insist on as a vital one in all his teaching on art—with diffidence, for it is quite possible that I have missed his meaning, or do not see deeply enough into it, or that I have not grasped the whole of it—with misgiving, for he has the world enough against him already, and it may be, if indeed he is ever aware of the fact, a natural source of vexation to him to find that I, occupying a post analogous to his own, in which I am responsible for the nature of all the art teaching which may fall to my share, so that my opinion in that sense must be considered of importance for right or wrong, should hold on an important point of that teaching an opinion different to his own. But I feel that this idea of his which I am about to challenge leads to so much that is false in the art of this country, to the production of so much of this merely recording work as being the aim of the painter, that I boldly run whatever risk I may in endeavouring to point out its fallacy. I may give it in his own words, as set forth in the second volume of "Modern Painters," where he enunciates the whole of his theory of art; and these are the words: "I wholly deny that the impressions of beauty are in any way sensual; they are neither sensual nor intellectual, but moral." And again, in a later work, "The Crown of Wild Olive:" "No statement of mine has been more earnestly and oftener contradicted than that good taste is essentially a moral quality." So I can hardly be mistaken as to the assertion, though, as I say, I may have failed to grasp the whole of his meaning. And in the sentence before the first one I have quoted he explains that "æsthesis," or the æsthetic faculty, properly signifies mere sensual perception of the outward qualities and necessary effects of bodies, which, although true, slightly degrades the meaning of the word æsthetic, which may surely be applied to our mental as well as our sensual perceptions. It is also to be remarked that the word sensual has come to be used in a lower meaning than æsthetic, as when we speak of sensual pleasures we mean rather the pleasures by which we gratify our lower appetites, so I prefer, for fear of misapprehension, the word "æsthetic." Now, in insisting on the æsthetic nature of our ideas and impressions of beauty, I labour under the disadvantage of appearing to abstract from them that elevated character which Mr. Ruskin has ascribed to them in his chapter on typical beauty. But, observe, I do not in any way deny the truth—the philosophical truth—of this view of ideas of beauty; I only say it is beside the question, and may easily lead to false conclusions with regard to art. It is not that I hold the error to lie in the assertion of the moral qualities of beauty, but in the inference that the perception of those qualities is essential to the production of a true work of art, and that all good art has been produced under the influence of this perception. I can, indeed, conceive of no writing more calculated to elevate our moral and intellectual nature than the chapters in which Mr. Ruskin treats of the different forms of beauty as types of the Divine attributes, and not only these chapters, but the whole of his works from beginning to end set before us more exalted conceptions of the beauty and sublimity of nature than has ever been presented to us in words, amounting, as I have said, almost to the setting forth of a new religion of the purest and noblest type. But it is to me impossible not to feel throughout that the theoretic qualities are not inherent in forms of beauty, but exist in the mind of the spectator, and that the appreciation of those qualities may therefore be equally excited by any art which professes to represent them. For, be it observed, if the æsthetic nature of these impressions be excluded, the seeing power of the artist, which is distinctly his æsthetic faculty, as distinguishing him from those who cannot receive impressions of beauty, is excluded also; in which case the earnest intention of the painter, his intense love of nature, his profound veneration and affection for the moral beauties to be found in the most trivial of God's works, may easily lead him to the belief that as long as he devotes himself to the imitation of these works he is setting forth the glory of the Creator in a better way than if he used his powers for the purpose of selection and combination. "Let the young artist beware of the spirit of choice; it is an insolent spirit at best," says Mr. Ruskin, as a sequel to saying that "if we can only admire this thing or that, we may be sure that our cause for liking it is of a finite and false nature." He must pardon me if I think that not only here, but throughout his works, he has not sufficiently separated two ideas; the faculty by which we may all derive a moral benefit from a humble contemplation of the infinite beauties and wonders of creation, from that artistic faculty which frames for us and forces upon us the perception and appreciation of those generic beauties which are not obvious to the unexercised mind. Ideas of beauty are doubtless capable of giving us a more elevated understanding of the nature of this world and this life the more they illustrate to us the nature of God, and so may have an ennobling effect on our whole moral nature; but this is beside the question when we are considering them in relation to art, when we have to decide, not what excites in us the highest religious or moral emotions, but how far the art is capable of conveying these emotions to our mind: so that we must admit the æsthetic or sensual nature of ideas of beauty, or we should have to admit that the man in whom they excite the most rapturous emotions is of necessity the greatest artist, rather than he who is distinguished by his perceptive gift. An artist, indeed, may possess his enthusiasm for beauty in this theoretic form, but how is he to explain in his work that this is the case? It is doubtless easy to answer that the artist who enjoys this high moral perception of beauty must show it in his work if his art is good; but this leaves it open to the spectator to assert that that art is not good in which he can perceive no traces of this emotion, and thus we come back to the original proposition that the moral qualities of beauty exist only in the mind of the beholder, who can supply them to any work of art which he considers to set forth these beauties most clearly. Now I think if I have put my argument satisfactorily (and I am not at all sure that I have done so) you will begin to perceive how these ideas may lead to that kind of art which I have explained as being rather of a recording and imitative than of a creative nature.

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* Read by PROFESSOR EDWARD J. POYNTER, A.R.A., before the Royal Institution.

The beauty of nature is very much more obvious in certain aspects and in some objects than in others; for one man who has the æsthetic faculty of being pleasurably affected by the beautiful forms and proportions of the Milo Venus, or Michael Angelo's Slave, or rather by the subtle distinctions of line which in nature go to make the difference between a form of high beauty and one that is of a mean or vulgar kind (the true æsthetic faculty this), there are a hundred who can feel the glory of a sunset, or the exquisite beauty of an anemone; and as the moral qualities of a typical beauty are set forth to the mind which can see them as gloriously in these last as in the first, it is not difficult for an artist to persuade himself that he is doing the most earnest and right-minded work in endeavouring humbly and patiently to imitate those beauties to the utmost of his power, and so convey to others the emotions that he feels; nay, he may go farther; he may persuade himself that there is nothing else worth doing, and that this work alone is of pure and spiritual nature, all other being sensuality, and therefore demoralising, so that, like the ascetics of old, there is no kind of work too humble for him to devote himself to; or what is worse than this (for work done really in earnest and with a spirit of patience has always in it something of value, and I may add, parenthetically, that no good work can ever be done without this spirit), the spectator may well imagine that the mind of the painter who laboriously produces for us again and again bunches of primroses and violets, is actuated by this earnest feeling and in possession of this high theoretic faculty, while, indeed, he has only been exerting his technical skill, and what amount of æsthetic faculty he may possess; nay, more, who has been but exercising just so much of his faculties as will enable him to make money in the quickest and readiest way. Thus it is quite possible for such a theorist, if himself destitute of the æsthetic perception, to exalt bad and antastic work over good if he imagines it to give a higher expression to the typical nature of beauty; so that the critic who is not offended by the crude and discordant yellow and blue of one of Turner's later sunset pictures, may yet believe that he finds in it a deeper perception of the infinity and purity of the evening sky, than in his earlier and more soberly harmonious representations, and so ascribe to it an artistic value which it does not possess. Or it is not impossible for him to exalt in this way the birds' nests of William Hunt over the mighty conceptions of Michael Angelo and Phidias, if he imagines he perceives this earnest purism in the one, and not in the others.

And in proof of this possibility we have only to look at the amount of artistic talent that is spent on painting little groups of flowers and fruit, or small landscape studies that might be developed into something better if the artist did not stop short with the idea, brought about by this train of thought, that he is doing the rightest work. It is not, indeed, Mr. Ruskin's fault that a noble theory has led to such poor results, for it is the misfortune of all great ideas that they degenerate most easily into cant; in illustration of which point I may relate an instance which has come under my own notice of a person who, on visiting an artist's studio, and having been shown pictures and designs of no mean order of beauty, begged to be allowed to see some of his "earnest work, his studies of leaves and flowers."

If, then, I have made myself clear, I shall be understood to have said that the idea must be expressed in a work of art, and not merely exist in the mind of the artist, or be supplied by that of the beholder; that the moral nature of beauty is of a kind that cannot be expressed in painting or sculpture, and that therefore, as far as art is concerned, ideas of beauty are, and must be, purely æsthetic, and that the theory of the moral nature of beauty is not only calculated to lead criticism astray when the æsthetic faculty is wanting, but may even induce an indifference on the part of the artist to higher forms of beauty than those which are at once obvious to the uneducated mind. Now, I will not stop to discuss another point in Mr. Ruskin's writings bearing on this subject, and to some extent akin to it, but in reality of a different character. I mean the idea which runs throughout his works of the necessity for a right state of moral feeling, not only in the producers, but in a nation or epoch, as essential to the appreciation and production of a noble and beautiful art. But I may remark that even if it can be shown that the best art has always arisen out of a pure state of national faith and domestic virtue, it does not follow that those conditions will always produce good art; if the æsthetic qualities be absent they certainly never will, and I can imagine no condition of national virtue which could cram ideas of beauty into the head of an average Englishman or Scotchman; but as far as regards the artist himself, it appears to me unquestionable that the æsthetic faculties being in two instances equal, there will be no comparison between the art of a man of a pure and noble mind and one of a mean and sordid nature. Indeed, the very highest artistic gifts seem to imply also a noble and healthy moral condition. Michael Angelo was himself one of the most simple and high-minded of men, incapable of any act of meanness, and we should find, I think, on examination, that all the truly great artists and poets have been of the same nature. . . .

I have described the second cause as arising from the fact that artists, from motives of indolence or interest, have allowed themselves to be led by the public, instead of, as of old, taking the lead in forming the public taste. . . . And here I may quote a saying of Sir J. Reynolds, as being to the point—"It is certain that the lowest style will be the most popular, as it comes within the compass of ignorance itself; and the vulgar will always be pleased with what is natural in the confined and misunderstood sense of the word." And again, "In the inferior parts of the art the learned and the ignorant are nearly on a level;" so with this authority, I feel in a position to repeat my original assertion that modern art has struck out for itself a path which the ancients disdained to follow, and has developed itself in the direction which no genuine artist or man of taste would ever wish to see it developed, having lowered itself to the appreciation of a class of patrons and admirers unknown to the artists of the old world. . . .

If, then, we are to look forward to the more general production of a class of art of that high creative kind which I have dwelt on, and which is at present decidedly in the minority in this land (though I must confess that I think there is a decided move in the right direction, and a desire for something of a more serious kind), we must, I think, in the first place, try not to encumber our minds with ideas, but rely on the cultivation of our perceptive faculties to show us the high beauties that lie beneath the surface of nature; and we shall then get rid of the notion that little pictures of fruit and flowers and landscape are anything more than studies to help us in the execution of better work, or to be done from time to time as mementos of some especially delightful aspect of nature in form or colour; and we must, above all, study the works of the great masters of antiquity. "Study the great works of the great masters," says Reynolds, "for ever. Study nature attentively, but always with those masters in your company; consider them as models which you are to imitate, and at the same time as rivals with whom you are to contend." . . . .

E. J. P.

STEVENSTONE HUNT.

TWO miles and a half to the north-east of Torrington, and in the parish of S. Giles—in one of the loveliest and most romantic localities of beautiful North Devon—stands the mansion of Stevenstone, the seat of the Hon. Mark Rolle—a building of magnificent proportions, and bold and picturesque design, surrounded by a park of more extensive area than any other in the county. This magnificent residence has for some time past been undergoing restoration and enlargement, and, in addition to this undertaking, the owner has expended large sums in embellishing the park and gardens in its immediate vicinity. A more striking building, says the *North Devon Herald*, it is difficult to imagine—a structure in which grandeur of outline is closely allied to a judicious combination of various comparatively minute ornamentations. It is in a mixed style of architecture, which partakes of the principal features of the Elizabethan blended with the Italian. The south-west front is 150ft. in length, including two immense towers at either end. Behind is seen the top of a massive grouped tower, rising from the opposite side of the building, and these three conspicuous elevations—all of which are highly embellished with carvings in stone and other decorations—form the most striking and characteristic points in the whole mansion. A new wing has been built, containing thirty bedrooms, &c.; another story has been added to the elevation, and the roofs are therefore new; the walls have been cleaned and re-pointed, and the interior arrangements are progressing most satisfactorily. Some idea of the vastness of the building may be gathered from the fact that the total length of the corridors and passages exceeds three-quarters of a mile. The architects are Messrs. Banks and Barry, of London, and the execution of the work has been entrusted to Mr. S. Hooper, of Hatherleigh; while Mr. R. Bradford is clerk of the works. The stone mostly used for the dressings is from Hatherleigh, mixed with what is known as Tisbury and Ham-hill. These are similar in texture, but slightly different in tint, and they harmonise well together. Messrs. Cowtan & Minnoock, of Oxford-street, London, are the decorators. The cost of the restoration and additions will be about £40,000.

BUILDING TRADE DISPUTES IN THE NORTH OF IRELAND.

THERE has recently been formed in Belfast a Trades' Council, representing various operative interests, whose functions are those of mediators between masters and men in matters of dispute, and who are to correspond with the different Trades' Councils of the United Kingdom, in order that practical and efficient rules may be drawn up for their guidance. At a large meeting of this body, in the Odd Fellows' Hall, Belfast, on Saturday, a dispute in which the whole body of carpenters and joiners are interested' engaged the almost exclusive attention of the Council. The Builders' Association had informed their men that on and after the 1st of November inst., it was their intention to pay them by the hour. The wages of carpenters and joiners would be: first-class, 6¾d. per hour; second-class, 6¼d. When working outside in winter: first-class men, 7d.; second-class men, 6½d., with one hour and a half for meals on the first five days of the week, and one hour on Saturday. The men had gone in to work, to be paid the full time of 54 hours per week, at 6¾d. for first-class men, and second-class men ½d. per hour less. But there are other and serious differences to be overcome. The men have resolved not to fit up any work manufactured by machinery, other than that produced by the builders of Belfast for their own use, with the exception of mouldings, sheetings, and floorings. Objection is also taken to the Builders' Association having ignored the old principle of giving three months' notice when any radical change was to take place; and the builders are also anxious that the boundary line of the terms which shall in future regulate the trade shall be extended from three to ten miles. It was the general feeling of the meeting that the dispute between the builders and carpenters is not fully ripe for action to be taken by the Council. Next came the grievances of the stone cutters. The men were generally willing to work for 7d. an hour during eight months of the year, and 7¼d. during the four winter months, as during the latter months their time would necessarily be abridged by the darkness. The masters object to the increased pay in winter. It was resolved that the Council offer their services to settle the dispute with the master builders and stone-cutters. Lastly, the bricklayers' complaints were entertained. They have represented to the masters that they object to work by the hour, as proposed. Their argument is that, under the present system they earn 28s. a week in the winter, and if they are knocked off by the wet they can get leave to work an extra quarter in fine weather to make up for the loss; whereas, if they worked by the hour, and they were knocked off at all, they would lose that hour. If they are unable to come to terms with the masters, they will seek the sympathy and assistance of the Trades' Council. There appears to be a commendable desire throughout the building trades in the North of Ireland generally, on the sides of employers and employed, to submit their disputes to arbitration, rather than adopt the suicidal policy of settling their differences by strikes, which are pregnant with disaster to all interests concerned.

The church of S. John, Yeadon, Yorks, was re-opened on Sunday week, after restoration. The pews have been replaced by open seats, the chancel arch widened, the sanctuary and tower paved with tiles, and the walls decorated in colours. Messrs. Milnes & France, of Bradford, were the architects.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—The opening meeting of the session took place on Wednesday evening in the rooms, 37, George-street, recently acquired by the Association for an architectural reading-room and library. On the walls were exhibited a series of large photographs from the London Albert Memorial, and water-colour drawings of Rome, Florence, and Venice, by the late David Roberts and the late J. O. Brown; also an interesting drawing of Melrose Abbey by George Kemp. In the course of the proceedings the President laid on the table a most complete set of photographs from Mr. Street's designs for the Government Law Courts, and the librarian directed attention to the recent valuable works added to the library and the architectural and fine art publications to be periodically received for the reading-room. After preliminary business, the President, Mr. John Paterson, delivered his inaugural address. He said that his first duty was to thank the members for the honour conferred upon him by being elected their president, and congratulated the Association upon the hopeful prospects of the session, and the increased facilities afforded by the new rooms to members wishing to take advantage of the library and the other means of study in their respective departments of art. Mr. Paterson noticed a new feature in the business of the session—viz., a competition by architectural apprentices for prizes offered by Mr. David Bryce, R.S.A., and Mr. J. T. Rochead, architects, for the best series of drawings from existing Scottish edifices not already illustrated. He hoped that the younger members would appreciate the importance of competing for these prizes. The address was of a general character, and reviewed a number of matters practical and artistic relating to architecture. The call that had been made upon the profession at large to invent something to lessen the expense of warming domestic buildings, and generally to adapt scientific principles and apparatus to domestic wants, was alluded to. Mr. Paterson then stated that the high price of building materials and labour is coming to be a matter of much concern, being the cause of some works being delayed or cut down, and others stopped altogether. How many have failed to reach the architect it is impossible to say. But this we know, that strikes and trade disputes are taking place every day. Contractors are insisting upon a strike clause being added to the conditions of every building contract. They say, "the knowledge of the insertion of such a clause has a tendency to prevent strikes on the part of the workmen, and enables builders to tender with more confidence for any contract." I have also been told by engineers and bricklayers that some contracts were now taken on what might be termed the "sliding scale." That is, the prices of the contract are so adjusted as to rise and fall with the prices of material and labour. Now, the object of the strike clause and of contracts upon sliding principles is to transfer to the proprietors the benefit of any reduction, or the burden of any rise, in the wages or price of materials, instead of paying a margin upon the contract price sufficient to cover the whole risk of the contractor. In general, proprietors would prefer the price to be fixed, and the whole risk added to the estimates, rather than become partners with the contractor in the manner indicated. Contractors have the same privilege of making their conditions in a contract as the architect or proprietor; they do not need to take one unless they are pleased with it. As times and circumstances change, the same clause cannot apply in all cases, and any strike clause for extending time should be so worded as to limit the time of endurance, &c., and not to take effect in the case of any factitious or unnecessary dispute. The wages in every class of labour connected with building has risen notably, and the working hours of all at the same time have been shortened. The masons of Edinburgh may be instanced, as they claim the credit of the short-time system—of the nine hours' movement. Well, they have reduced their working time 15 per cent., and in consequence their labour is now 65 per cent. higher than the average rate before the movement began. Although some of the other departments may be more and some less, that may be taken as an average of the whole. As to materials, it may be remarked, that those dependent on labour or coal to make or bring them to hand have risen highest in price. Bricks and iron are up 100 per cent.; lime, 35 per cent.; rubble stone, 33 per cent.; cubic stone, 50 per cent.; ashlar, 25; and rybats, 12 per cent.; glass, 25 per cent.; joiner work and ironmongery, from 10 to 35 per cent. The high price of coal has already seriously affected the coal trade, so much so that the advisers of the miners are getting alarmed at the condition of things. They now see that they have carried matters too far, and wish to abolish strikes, and to settle trade disputes by arbitration. It is to be deeply regretted that they have drifted so long on the stormy sea of strikes before discovering the hopeful channel of arbitration, which leadeth to the calm waters of contentment. It is to be feared the present high prices will have a similar effect in destroying the building trade and driving off investors. But before this is accomplished to any serious extent, it is to be hoped that the men will learn wisdom, and instead of striking take to arbitration. It is to our advantage, as acting for our employers and our own behoof, to do what we can to promote a conciliatory spirit between masters and men, to impress upon them that our advantages are all bound up together; that if building ceases we are partners in the consequences. I have considered it expedient to make these remarks in consequence of the unsatisfactory state of the building trade at the present time. Mr. Paterson then proceeded to consider some matters which have interested the architectural world during the past year, especially noticing points which indicate progress and mark the present period of architecture as one of progressive excellence and grasp, noticing, in the first place, the completion of the Albert Memorial, London, remarking that it exhibits that type of Gothic architecture which we may be glad to adopt as a national example of the style of the period, and that from the beauty of its design and the costly nature of its material and adornment, we might proudly claim for the Albert Memorial a first place amongst the most celebrated monuments of modern times. The new Law Courts of London, designed by Mr. Street, the Manchester Town Hall, by Mr. Waterhouse, and Fettes College, Edinburgh, designed by Mr. Bryce, were next passed in review as being among the foremost works of the time, and giving the best idea of the characteristics of the ever-progressing style of the present day. Mr. Paterson also took occassion to advert to the architecture of Cockburn-street, disfigured as it is by "the great bald north wall of our municipal factory," which he contrasted with the splendid Hotels de Ville of Belgium. Mr. Paterson continued to speak of the state of architecture on the Continent, which he had made his study during a recent tour, and of the restorations now in progress at the Cathedrals of Cologne, Mayence, Frankfort, and Strasburg. He also referred to the restoration of S. Giles' Cathedral, wishing the architect and promoters all success. Mr. Paterson concluded by noticing the competition designs of the new Cathedral of St. Mary, Edinburgh, which he characterised as a splendid competition. Every one of the competitors deserved credit for the handsome manner in which the designs and drawings were produced. It was gratifying to see his countrymen taking so creditable a position in the competition. At the close of the address, a vote of thanks to Mr. Paterson was moved by Mr. James Ballantine, and seconded by Mr. T. Ross. We understand that at the next meeting the competition designs for the new Cathedral will be discussed by this Association, and an interesting evening is looked forward to.

Oxford Architectural and Historical Society.—The first walk this Term took place on Saturday week, when S. John's College and S. Giles's Church were visited. The members and their friends met at three o'clock in the Hall of S. John's College, where they were welcomed by the President and the Dean. The present College was founded by Sir Thomas White in 1555. The first improvement in the College took place about the year 1610, when four sets of rooms were erected over the kitchen. Other additions were made to it in 1638. The inner quadrangle was built in 1635, and the library many years previously—in the year 1596. Archbishop Laud added 20ft. to the library, and completed the inner quadrangle, intending the whole of it to be used by Commoners, except a portion for the residence of the chaplain. With regard to the chapel, he remarked that it was not quite clear where the original site of it was. It was consecrated in 1530, and very much beautified by Sir Thomas White, but the vestments and ornaments were taken away at the revolution. They were, however, restored in 1602. The company then visited the underground cellar, which has a beautifully groined roof, the chapel, and the library. In the latter place, the dean showed the company a cope and other vestments of the period of Queen Mary, and also a cap which had been worn by Archbishop Laud, and which was kept in a glass case. S. Giles's Church was next visited, and Mr. James Parker spoke on the architectural features of the building, and pointed out that the tower not being square with the rest of the church showed that the walls were constructed at different dates. On looking round the architecture of the church, he did not see a single moulding or anything that seemed to coincide with the date that had been mentioned—1120; but the arch by the side of the tower, and the circumstance that it was not in a line with the rest of the church, led him to believe that the lower part of the tower was the only portion which remained that was dedicated in the year 1120. Then they came to an accidental circumstance. About the year 1138 this church was given to Godstow, and perhaps the nunnery did nothing to the building, or add to it, but this Hugh, who was bishop of the diocese from 1186 to 1203, seemed to have taken a great interest in it; but there was nothing definitely said in the register of his having restored or rebuilt the church. There was, however, a legend to the effect that he had been the rebuilder or founder of the church, but he had no doubt that the truth was that while he was bishop of the diocese several persons provided the funds, and he added to them, aad was the consecrator of the church, as they now saw it. At that time it was changed from the twelfth to the thirteenth century style. Mr. Parker then explained that when the church was being restored a few years ago, some small arches were discovered on each side of the main arch of the chancel, which were considered to have been part of the old walls of the Norman church of 1120, but he thought that they were merely the relieving arches.

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RECENT PATENTS CONNECTED WITH THE BUILDING TRADES.

1149. J. L. Norton, London, "Walls, ceilings, and floors."—Dated 17th April, 1872.

This provisional specification describes various ways of employing asphalte in the construction of walls, ceilings, and floors of buildings, and other structures.

1157. T. C. Fidler, Emberton, Buckinghamshire, "Suspension bridges and iron arches." Dated 18th April, 1872.

This invention relates to certain improvements in the construction of suspension bridges and iron arches, whereby the chains or ropes of a suspension bridge are so arranged and braced together that they offer a firm and inflexible support to a passing load, and carry it without the distortion and oscillations common to ordinary suspension bridges. To effect this the inventor employs, in the place of a single chain, two chains which are attached together, or to the same saddle, upon each pier or abutment, but hang across the opening in different curves, crossing each other in the centre of the span; the upper chain of each half span should lie in a straight inclined line, and the lower chain in a parabolic, or other curve, to which the upper chain of the other half forms a tangent. The chains may be pinned together or attached to the same centre link at the point of their intersection. The upper and lower chains are braced together by diagonal bracing. The effect of irregular loading is, however, principally taken up, not by the bracing, but by the chains themselves. When one half of the span is uniformly weighted, and the other half entirely without weight, the load is carried by the lower chain of the weighted half, and the upper chain of the other half, which together form one continuous chain of such form as to be in equilibrium under that load. The weight of the straight upper chain of the unloaded half, and the rest of the weight of that half is carried in like manner by the upper chain of the loaded half, and the lower chain of the unloaded half. When only a part of either half span is loaded, the effect of that irregularity of load is taken up by the bracing. In applying this invention to the construction of arches of wrought or cast iron, each rib is hinged at the abutments, and at the crown; each half rib has an upper and a lower flange, which lie close together at the crown, and at the abutments, and are more widely separated between those points, the lower flange being straight from abutment to crown, or only slightly arched, and the upper flange being more sharply arched, and so arranged that the upper flange of one half rib approaches the centre hinge in the same line with the lower flange of the other half rib, or nearly so. The web between the two flanges may be plate or lattice, or other bracing. In the same way the suspension bridge may consist of two inverted half ribs hinged together at the centres, and hinged to the saddles upon the piers, and built of plate and angle iron. A suspension bridge constructed according to this invention may have a side span on each side of the centre span, and each of such side spans may be carried by a pair of braced chains similar to one half span of the centre opening.

1288. J. Walker and A. E. Ragon, London, "Constructing buildings, bridges, &c."—Dated [illegible]th April, 1872.

The novelty in this case consists in forming the pillars and framing of buildings and bridges of thin strips of wood and iron, and casing, or partially encasing, the whole in thin iron.

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On Sunday last Crawfurdsburn Free Church, Greenock, was reopened. [illegible] and a general renovation.

Elmswell Church, after undergoing extensive restoration, [illegible] week. The total cost of the restoration amounted to £1,[illegible].

Building Intelligence.

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CHURCHES AND CHAPELS.

Alverthorpe.—The Methodist Free Church building committee have instructed Mr. William Watson, architect, of Wakefield and Doncaster, to prepare a design for a chapel and Sunday schools for this place.

Arthingworth, Northampton.—The Right Rev. the Bishop of Peterborough reopened S. Andrew's Church on the 6th inst., after its restoration and partial rebuilding, the cost of which has been borne almost entirely by its rector, the Rev. H. R. Rokeby. The works have been more extensive than was originally contemplated, owing to the discovery that the stones of the walls had been put together with nothing better than mud, clay, and water, with no cementing properties whatever. The nave piers and arches, south aisle and the south porch, had to be almost entirely taken down; wherever possible the old work was simply cleaned and re-erected, but many new portions had to be supplied. New oak roofs of steep pitch have been erected over the nave aisle and chancel, with curved ribs springing from richly carved corbels, containing birds, foliage, and fruit. The chancel has a ceiling of polygonal form, divided into panels by oak ribs, having carved bosses at the intersections. They are covered externally with Whitland Abbey green slates. The east end of the chancel has been rebuilt, so as to make it of its original length, the east wall having been erected 7ft. or 8ft. beyond the previous one, in the position indicated by the original foundations. Three new two-light side windows and a north door have been added to the chancel. The east window is made of three lights, with good geometrical tracery, and has been filled with stained glass by Messrs. Heaton, Butler, & Bayne—the subject is the Crucifixion. The reredos, pulpit, and font are of Caen stone, the reredos and font having Devonshire marble shafts, and richly carved panels and spandrels containing foliage and sacred emblems. Among the varieties of the foliage used throughout the church, which has been all conventionalised from nature, may be mentioned the wheat and vine, the passion flower and lily, the oak, hawthorn, maple, holly, trefoil, ivy, and the rose. The church is heated by one of Porritt's underground stoves. The nave and aisle have been seated with substantial oak open benches, with carved bench ends, having foliage conventionalised from nature. The reading desk, lectern, and chancel seating, are also of oak, and enriched by carved foliage of varied designs. The whole of the work of every kind is of the very best description. The total cost of the works has been about £2,000. The architect was Mr. James K. Colling, of London, and the builder Mr. Robinson Cornish, of North Walsham, Norfolk.

Betley.—The parish church of Betley was reopened on Thursday week. The roof of the nave of the church has been stripped and retiled; the clerestory windows have been filled with cathedral glass; the whole of the old pews in the nave have been lowered and made into open benches; a new floor has been laid under the pews in the nave and aisles; the pulpit has been lowered, and new choir desks have been provided in the chancel. The work has been done by Mr. T. Espley, of Eccleshall, under the superintendence of Messrs. T. Lewis & Son, architects, of Newcastle. The total cost has been nearly £500.

Beverley.—The sanctuary of the (Roman) Catholic Church at Beverley has been completed and adorned in memory of a benefactor. The chancel is terminated by a semicircular apse, the lancet windows of which are 15ft. from the floor level. Below them, and the full extent of the three easternmost lancets, is an arcaded reredos, with panels of alabaster and columns of delicate Poltesco serpentine, and in the panels are sculptured medallions. The reredos is flanked by bold pinnacled buttresses and niches, in which are figures of Our Lady and S. Joseph, and in the centre is a lofty baldachino or throne, placed between the east wall and the back of the retable. Within, this is lined with veined and polished alabaster, and has a bracket for the monstrance. The tabernacle is of white alabaster, with columns of Levant marble; the altar and superaltar, also of white alabaster, have an arcaded front of Galway marble, bearing a massive altar slab of Dove marble. The tabernacle has an iron safe, with a door of copper. The interior is entirely gilded, and the silk lining put on thin boards of cedar wood. The windows have a series of medallions illustrating the life of S. Joseph. The floor of the sanctuary is of mosaic and encaustic tiles, the steps being highly polished Derbyshire fossil marble. The chancel walls are decorated in gold and colours on each side of the reredos. Mr. Earp, of London, has executed the altar and reredos; the marble altar-rails and steps are from the establishment of Messrs. E. and T. Smith, of Sheffield; and the design of the whole is by Mr. Charles Hadfield, of Sheffield. The tabernacle door was made by Mr. Bourdon, of Ghent, from the design of Mr. Bentley, of John-street, Adelphi, London.

Cambridge.—The foundation stone of a new Congregational Chapel was laid at Cambridge on Tuesday. The building will cost £8,000. In the plan the practice is followed of having a very small number of nave piers, and these so placed as to cause no obstruction. The total number of sittings which will be provided will be 700, six hundred on the lower area, and the rest in a tower gallery. The tower, 26ft. wide on the lower stage, stands in front of the nave, into which it opens by a lofty arch. Across this runs a stone arcade on granite shafts, supporting the gallery. The nave itself will be 58ft. long and 53ft. 6in. wide, terminated at one end by the tower arch, at the other end by the arch of an apse containing the choir, and divided lengthwise by four large arches springing from two piers. Above these arches are clerestories 12ft. high, each pierced with two groups of lancet windows. The ceiling is a wooden panelled one, of a domical form, and is intended to receive coloured decorations. The total length internally will be about 96ft. A school for about 300 children will adjoin the church. The materials of which the church is being erected are, externally, Yorkshire Parpoint for the walling, and Ancaster stone for the dressings; the internal walls will be of brick, with a wooden lining round the lower portion of the work. The carpenter's work will be chiefly in Baltic timber; the joiner's in picked pitch pine. The tower will have a stone roof, starting at a point 85ft. from the ground, and rising nearly 40ft. higher. The stage below this will be octagonal, as in some few English, and many Continental, churches; but square piers attached to the oblique sides of the octagon will carry up the angles of the tower to the usual point. The octagonal stage has a large single light window, with jamb shafts and mouldings on each of the cardinal faces. The style throughout may be described as Early English, with some slight adaptation of Early French detail. The architect is Mr. James Cubitt, the author of "Churches for Congregations."

Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels.—The usual monthly meetings of this society were resumed on Monday. Grants of money amounting to £2,695 were made in aid of the following objects, viz.:—Building new churches at Birmingham, S. Margaret; Bishop Auckland, S. Peter, Durham; Crowthorne, near Wokingham, Berks; Herne, near Worthing, Sussex; Llanelly, Carmarthen; Poplar, S. Saviour, London; and Redbrook, near Coleford, Gloucester. Rebuilding the churches at Atlow, near Ashbourne, Derbyshire; Upper Bullinghope, near Hereford; Cambridge, S. Giles (on a new site); Glazeley, near Bridgnorth, Salop; Llannwchllyn, near Bala; and Millbrook, near Southampton (on a new site). Enlarging or otherwise increasing the accommodation in the churches at Bensham, near Gateshead, Durham; Hentsridge, near Blandford, Somerset; Longstone, near Bakewell, Derby; Lynton, near Barnstaple, Devon; Oswestry, Salisbury; and Wymondham, near Oakham, Leicester. Under urgent circumstances, the grants formerly made towards building S. Philip's Church, Newcastle-on-Tyne; rebuilding the churches at Kirby Knowle, Yorks; and Kenarth, Carmarthen; and towards enlarging or restoring the churches at Bywell, S. Andrew's, near Newcastle-on-Tyne; Kirby Overblow, near Witherby, Ripon; Norton, near Faversham, Kent; Stoke Newington, S. Faith, London; Ulting, near Maldon, Essex: and Warminster, Christ Church, Wilts, were each increased. Grants were also made from the School, Church, and Mission-house Fund towards building school or mission churches at Charton-in Dover; North Gosforth, near Newcastle-on-Tyne; Oswaldtwistle, near Manchester, and Windsor, Berks. The gratifying announcement was also made that a London merchant had promised a contribution of £5,000 to the society.

Millbrook.—The dedication stone of the new Church of the Holy Trinity, at Millbrook, was laid on Thursday week. The church will cost about £7,000. The walls will be built of Swanage stone, with Farley Down stone dressings, in the Early English style of architecture, and the church will comprise nave, chancel, side aisles, chancel aisles, vestry, and tower and spire, 170ft. high. The length of the chancel is to be 38ft., height of the roof of the nave 58ft., length of nave 82ft., and accommodation will be provided for 700 people. Mr.

Henry Woodyer, of Guildford, is the architect, and Messrs. Newman & Son the builders.

Normanton.—The Methodist Free Church has been opened, and is a substantial red brick building with stone dressings, open stained roof, and stained deal fittings, and will seat 200 persons. Mr. William Watson, of Wakefield and Doncaster, is the architect; and Mr. John Foster, of Normanton, is the contractor for the whole work for £710.

Wolverhampton.—S. Paul's Church, Wolverhampton, after being closed for alterations and repairs, was on Friday last reopened. The vestry and superincumbent organ loft in the chancel have been removed, the floor of the chancel raised and placed with seats for the choir, and a handsome five-light perpendicular window let into the east wall. A new vestry has been built on the north and an organ chamber on the south of the chancel, both filled in with screens. The alterations have been well done by Mr. P. Horsman, builder, from designs by Mr. J. R. Veale, architect, both of Wolverhampton.

BUILDINGS.

Saltaire. — The Saltaire Club and Institute, which was erected for Sir Titus Salt by Messrs. Lockwood & Mawson, has been decorated throughout by Mr. Henry Briggs, of Bradford. The architecture of the lecture hall is Roman-Corinthian. The decoration applied, and for which the room was originally designed, is Pompeian. The wall surfaces are painted in Pompeian red, the masses of colour broken by the pilasters and the windows. The surbase, running round the room to a height of 5ft., is divided into panels of black, with stencilled patterns in gold colour, the alternating panels under the base of each pilaster being in red, with a border. The pilasters are panelled, and the panels are filled in arabesques. Dividing the upper and lower panels of each pilaster are smaller central panels, bearing allegorical masks of the arts and sciences, painted in flesh colour on a blue ground. The capitals are in green bronze, relieved in the background with blue, and brought out with gold. The frieze is a rich maroon, the names of the most celebrated musical composers being painted thereon chronologically. The cornice and architrave are decorated in colour, relieved with gold. The ceiling, coved at the sides and panelled, is divided by beams ornamented with guilloche enrichments. The panels are octagon-shaped, and there is a judicious use in the ceiling of cream colour, gray, and gold. The windows bear stencil ornaments carried up the reveals, and the archivolts and sashes are in gold bronze. The back wall of the orchestra is divided by coupled pilasters, and in the large central panel a floating figure of Music, life-size, has been painted. The front of the orchestra is divided into panels, and the balcony at the opposite end of the hall has been treated so as not to interfere with the general effect of the decoration. In the Schools of Art and the Billiard Room the walls are Pompeian red, and in the class-rooms, reading-room, and library, and the staircase and passages, the walls are pale green, finished with a rich ornamental dado and surbase. Throughout the whole building the ceilings are gray and cream colour, picked out with red, gold colour, and green, with pale bronze green enrichments.

SCHOOLS.

Northampton.—At the meeting of the Northampton School Board on Thursday week the propriety of appointing an architect or architects to prepare plans and specifications for the building of the new schools was discussed. It was suggested that the competition should be confined to the county, as it was thought by throwing it open the Board would be flooded with plans from different architects in the country. Ultimately, however, it was considered that it would be best to throw the competition open, and it was resolved that the Sites Committee should be empowered to insert advertisements for plans for two schools.

Leeds.—At the meeting of the Leeds School Board last week, it was moved that the recommendation of the committee that the design (No. 9) bearing the motto "Zachariah" be adopted as the best for the Green-lane School. Mr. Long said he differed from the majority in recommending the design for Green-lane School in consequence of the great difference in the estimates, and he moved that it be an instruction to the Building and Sites Committee to confer with one or more architects as to the terms on which they can carry out, if deemed desirable, designs for the above-named school, subject to the general approval and direction of the Board. He had no feeling whatever against the decision of the majority of the committee. The highest was £3,590, and the lowest £2,650, and he was not disposed, either as a tradesman or as the representative of the ratepayers, to pay 25s. for a sovereign. The average cost of the four lowest plans was £7,494, and he could not bring himself to believe that the architects who had sent these in could be altogether mistaken, and therefore he was inclined to imagine that the estimate recommended was far too high. If, under these circumstances, one estimate was selected, it was not fair to other architects, all of whom were instructed that if the estimate were exceeded 10 per cent. of the commission would be forfeited, and, as they were all equally respectable, it was fair to presume they had calculated the cost and put down a fair estimate. Mr. Ellershaw seconded the amendment.. Upon a division the amendment was rejected, and the original motion became a substantive resolution. At this stage the Board resolved itself into committee, and in this capacity they continued the discussion. Upon resuming as a Board, a division was taken upon the motion to adopt plan No. 9. The votes being equal, the chairman gave his casting vote in favour of the motion, which was accordingly carried. Mr. Woolley moved that the Board adopt plan No. 7, marked "Minerva," for the Hunslet Jack-lane School. It provided for 600 children, at a cost of £6,565. Mr. Beckworth seconded the motion. Mr. Wilson moved the acceptance of plan "No. 1," which, although it had a much plainer elevation, would accommodate 80 or 90 more children, at a cost of £6,521. Mr. Ellershaw seconded the amendment on the ground of economy. After some discussion, the original motion was rejected. Thereupon Mr. Beckworth moved as a second amendment that design "A Y Z, No. 12," be adopted, which provided for 613 children, at a cost of £5,935, but this proposal was also rejected. Mr. Wilson's motion in favour of No. 1 plan was then put as a substantive resolution, and it was likewise lost, upon which it was agreed, on the motion of Mr. Beckworth, to refer back the plans for Hunslet Jack-lane School to the Sites and Buildings Committee. On the motion of Mr. Woolley, seconded by Mr. Long, it was unanimously agreed to accept the plan marked "A B C, No. 3," for Beeston School, providing accommodation for 446 children, at a cost of £3,150. This plan was found to be that of Mr. E. Backhouse, and, upon the motto envelope being opened, it was found that the successful competitor in the case of the New Wortley Green-lane schools was Mr. George Corson.

Leeds.—The foundation stone of a new School Board school was laid at Leeds on Thursday week. The building is to be erected from the plans of Messrs. William Perkin & Sons, Park-square, Leeds. The style adopted is Domestic Gothic. The materials are brick with stone dressings; the doorways have pointed heads with tracery heads and mullions; the windows are of three and two lights, with stone sills, mullions, transomes, and circular heads, recessed with inter arch of brick and stone voissoirs and label moulds. Those in the gables have pointed heads, and are filled with plate tracery.

Wakefield.—The new Wesleyan schools at Wakefield were opened on Tuesday week. The cost has been £1,950. The building is of red brick with stone dressing, and has been designed to harmonise with the adjoining chapel. The large schoolroom or lecture hall, is 72ft. long, 33ft. wide, and 19ft. 6in. high. There are five class-rooms, each about 14ft. by 12ft., and a room 33ft. by 30ft. The works have been carried out from the designs of Mr. William Watson, of Wakefield.

Wakefield.—Four designs were submitted in the School Board competition, and the Board have accepted that sent in by Mr. W. Watson, architect, of Wakefield, who has received instructions to prepare the necessary contract drawings. The buildings are for 350 children.

ARCHÆOLOGICAL.

Researches on the Site of Troy.—Mr. Heinrich Schliemann, a German archæologist, is at present engaged in making excavations on the site of ancient Troy. He commenced in October, 1871, a trench across an eminence in the Trojan plain, called by the Turks "Hisarlik" (citadel), which he conjectured covered the site of the ancient citadel of Pergamos. He has persevered in this work for about twelve months, and in last September succeeded in reaching what he considers to be the primitive surface of the ground, after digging for about 45ft. from what is now the surface. At this depth he discovered the ruins of a house evidently scathed by fire, and in it the skeleton of a woman with her golden ornaments. He also found the bones of a child and some thousands of specimens of tiles, or pieces of baked clay, which are supposed to appertain to pre-historic times, and which are such as no museum in Europe possesses, save that at Parma, where there are two specimens.

CIVIL ENGINEERING.

Projected Railway Improvements at and near Bradford.—The Lancashire and Yorkshire Railway Company intend to apply in the next session for powers to make various improvements in their lines. Amongst these is the widening of the line approaching Bradford Station, commencing about fifteen yards north of Mill-lane, and terminating in the station at the north side of Bridge-street, and the substitution of an open cutting for the tunnel between Croft-street and Chandos-street; the crossing of Caledonia-street by a bridge, the formation of a new street to facilitate the traffic over the bridge, and to require the Bradford Corporation to contribute towards the alteration of Caledonia-street and the cost of the new street. It is proposed to construct a new road at Low Moor to obviate the necessity of crossing the line on the level, and to require the North Bierley Local Board to contribute towards the making and maintaining of the new road.

The Great S. Gothard Tunnel.—Messrs Krebs & Co., of Cologne, write to us:—"As the tunnelling through the S. Gothard must be considered as a national undertaking of vast magnitude, it will interest your readers to learn that the first order for 25 tons of "lithofracteur" has been given us, under our contract for supplying this explosive for the blasting operations. To form an idea of the work to be accomplished, and of the hardness of the stone to be cut through, it is supposed that, even with the use of this most powerful explosive, over 1,500 tons will be required."

CHIPS.

At the weekly meeting of the Metropolitan Board of Works, on Friday last, Colonel Hogg was re-elected chairman for the ensuing year.

Mr. Skelton's catoptric lamp (described some time back in these columns), which was recently tried with good results in Moorgate-street, is now used in the streets of Southampton.

The new (Roman) Catholic Chapel at the Sacramentive Convent, Taunton, was consecrated and opened on Wednesday week. The chapel is a stone structure, with a marble altar of exquisite workmanship.

On Monday afternoon the corner stone of a new chapel and schools for the Unitarian congregation was laid at Stockton. Mr. E. E. Clephan, of Stockton, is the architect of the building. The new chapel and schools are to be built of brick, with stone facings, and at a cost of £2,500.

M. E. A. Olivieri is modelling a life-size bust of the late Mr. T. Allom.

A Congregational Church is about to be erected in Barton-street, Gloucester. A design, in the Early English style, by Mr. Tait, of Leicester, has been selected in a limited competition.

Our advertising columns announce that the mansion at Leamington, illustrated this week, will be brought to the hammer early next month by Messrs. Jones & Raggett, of London-bridge, and, if rumour is correct, subject to a reserve that is ridiculously low in the face of the enormous cost of the building.

A new stained glass window is about to be erected in All SS. Church, Maidstone. The subject is the "Pentecost," the side lights being filled with scenes from the lives of SS. Peter and Paul.

The Bradford Corporation have given notice of an application to Parliament for power to enlarge the waterworks of the town, and extend the area of supply, so as to form fifteen new streets. In addition to this, a bill will be introduced next session on behalf of a public company for the construction of a system of tramways in the borough.

A reduction has lately been made by the Dean and Chapter of S. Paul's in the charges for admission to the upper part of the cathedral. Each person will now be allowed to see the library, clock, whispering, and stone galleries for 6d., and with the other galleries and the ball on payment of 2s.

The sons of the late Mr. Joseph Pease, of Darlington, have presented a site for a new cemetery to the town of Darlington, and have charged themselves with the necessary cost of erecting the requisite buildings thereon.

An annual general meeting of the Wolverhampton Freeholders' Permanent Benefit Building Society was held last week. The report showed that the profits for the past year amounted to 2s. 1d. in the pound on the share fund, which was equal to a little more than 10 per cent. per annum. The balance-sheet showed that, including a balance from last year's account of £1,106, the receipts were £11,155. The chief items under the head of receipts were: Contributions, £5,422; sales of property, £1,508; interest, £1,391; and premiums, £979. On the out-going side, the principal items were: Advances on mortgages, £5,493; deposits repaid, including interest, £1,964; realised shares, £1,272; shares repaid, £760; and balance with bankers, £1,229.

MANSION AT LEAMINGTON.

ONE of our illustrations this week represents a noble detached mansion erected at Leamington, by Mr. A. Welby Pugin, for the private residence of Major Seel. The buildings are in the modern Gothic style, substantially built of Bath stone and Suffolk bricks, and no expense has been spared in completing the whole in its minutest detail in the most elaborate and finished manner. On the ground floor is the entrance hall, an inner vestible facing a grand staircase, 10ft. wide, entirely constructed of stone, beautifully carved, with handsome marble columns supporting the roof; drawing-room, 39ft. by 18ft.; dining-room, 28ft. by 20ft.; library, 28ft. by 18ft.; a morning-room, ante-room, study, lavatories, deed-room, plate safe, and in a corridor which is shut off from the reception rooms is a perfect suite of domestic offices. On the first floor is a chapel or picture gallery, a fine billiard-room, thirteen principal bed chambers, three dressing-rooms, bath-room and offices, and seven sleeping apartments for servants over. All fireplaces and chimneys are in marble or stone, and the woodwork in polished pitched pine, entirely dispensing with paint. The house, conservatories, and carriage house are heated by hot water, and rain and hard water is supplied throughout. The grounds are tastefully laid out, and the stabling yard and outbuildings are judiciously placed in the rear.

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ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on Friday evening last, the President, Mr. J. Douglass Mathews, A.R.I.B.A., in the chair, the following gentlemen were elected members :—Messrs. J. Neill, G. A. Musgrove, W. H. Lloyd, Geo. Snow, P. Hunter, H. J. Hermann, C. H. Townsend, R. T. Conder, and H. G. Brace.

Mr. B. A. PAICE, one of the hon. secretaries, read a letter from M. Vandervelde, secretary to the Belgian Legation, announcing that the Belgian Government had initiated a public competition of architects for the construction of a new hospital at Antwerp, and intimating that in case any of the members of the Association would like to compete, he enclosed particulars printed in Dutch, French, and English.

The PRESIDENT announced that at the next meeting of the Association (on Friday next, the 29th inst.), the Prize Essay of the Association would be read by the author, Mr. Johnson. The subject was "On the Special Characteristics of Mediæval Architecture Obtaining in Particular Districts of the United Kingdom."

Mr. T. ROGER SMITH, F.R.I.B.A., then delivered the first of a course of five lectures "On Professional Practice." A brief discussion ensued, in which Messrs. T. H. Watson, R. Phené Spiers, S. F. Clarkson, H. H. Stannus, and the President, took part, and the thanks of the meeting having been unanimously tendered to Mr. Smith for his able lecture, that gentleman briefly replied, and the proceedings terminated. It was announced that Mr. Smith's second lecture would take place on Monday evening next, the 25th inst., at 8 o'clock.

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THE SLOW COMBUSTION GRATE.

WITH coals at their present price and the prospect of no immediate and little permanent diminution in their cost, anything promoting their "slow combustion" while securing the advantages of heat and ventilation is worth attention. One of the most perfect methods of attaining this end is to be found in the new Slow Combustion Grate, invented by Messrs. Clark & Hunt, of 159, Shoreditch. The bars of the grate are placed close down upon the hearth, the fire space being lined at the sides and back with fire-brick, and a solid fire-brick lump fitting into and resting on a cast-iron tray forms the bed on which the coal is burnt. The upper surface of the bottom fire-brick stands about two inches above the hearth, so that the grate can be put into its place after the tile hearth is put down. An ornamental screen, or lower fire bar fitted in front of the fire-brick, rests on the hearth, and adds to the appearance of the stove. The warming power of the grate is considerably in excess of that of the ordinary grate. The fire-brick at the bottom ensures the most complete combustion, causing no cinders nothing but ashes, to be left when the fire is burnt out, and as no current of air passes upwards through the fire the heat is not carried up the chimney. For bedrooms the advantage offered by the Slow Combustion Grate is obvious, in the absence of any necessity for replenishing the fire throughout the night. One of the grates is always to be seen in operation at Messrs. Clark & Hunt's show-room, and some new designs, in which they have embodied the "slow combustion" principle, are worth the attention of architects and builders.

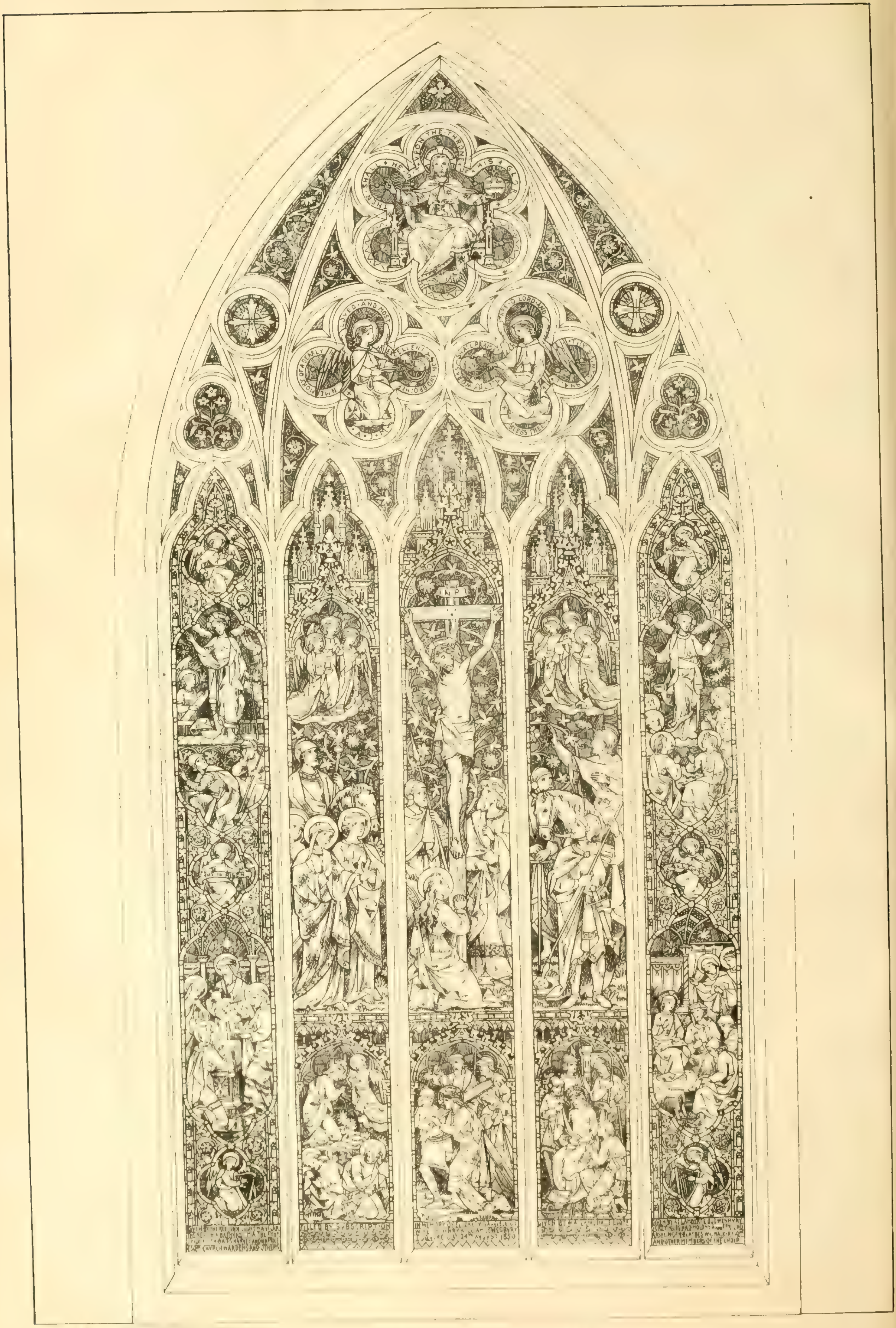
ON THE ORNAMENT CASTS IN THE ARCHITECTURAL MUSEUM.

UNDER the auspices of the Council of the Royal Architectural Museum, a member of that body, Mr. William Brindley, of the well known firm of Farmer & Brindley, consented to deliver a series of practical explanations of the architectural ornament casts in the Museum, with a view of increasing the usefulness of the collection and benefitting art workmen and others interested. It was arranged that the lectures should be given on Saturday afternoons. The first lecture of the series took place on the 2nd inst., when the lecturer took for his subject the

GREEK, ROMAN, ROMANESQUE, AND BYZANTINE CASTS.

Mr. BRINDLEY commenced his lecture by a brief reference to Egyptian architectural art, although there were no casts from Egyptian work in the Architectural Museum. He recommended, however, that the Egyptian collections in the British Museum and at the Crystal Palace should be well studied, and not merely passed by as simply ancient curiosities. An hour or two employed now and then in the study of those collections would be well spent, and little observation would be required to discern that what we now knew began, and made great progress, with the Egyptians. Take one of their grand old lions, for instance, and notice the masterly *pose*, and the wonderful and simple drawing; it was grand in its simplicity. If the art-workman tried to model it or even draw it then he found out what was in it. Then, consider the material of which it was made—the hardest granite. This same grand simplicity of outline was carried out through every object the Egyptians illustrated, animate or inanimate; whether in drawing, painting, or sculpture, the same masterly mannerism pervaded the whole. Those old Egyptians, if here, could teach us something in the way of drawing, and he (Mr. Brindley) could not think of anything that would do young artists more good than a course of study of natural objects (say animals and plants), endeavouring to draw and model them on the Egyptian method. By this study of severity the works of the present day would gain grandeur, which they now lacked. The purpose of the Egyptians in their use of the art of design was not so much to excite the imagination as to inform the understanding. As a rule, the elements of Egyptian ornament had a practical meaning. They were not often, if ever, arbitrarily chosen, simply for the beauty of effect, but were generally historic records. Cattle-breeding and agriculture were, however, among the most prominent subjects. The plants they illustrated were chiefly those that grew on the banks of the Nile. These were treated conventionally, but still naturally. Those in most common use were the lotus or water-lily and the papyrus. The variety of ways in which these were used is surprising, and these conventional forms, in connection with geometrical ones, were still popular ornaments, and had been through all times, as the fret, zigzag, nave scroll, spiral, &c. Unfortunately for the Egyptians, their artistic works at an early date settled down into a matter of *rule*, so, consequently, after the rule was established, no further progress was made, and for about a thousand years they kept on doing the same things without any attempt at improvement. The lecturer passed over the Assyrians and the people of Eastern and Central Africa, for, with regard to architectural ornament, for ages they made no progress, except in surface work and textile fabrics. In matters of delicate drawing and harmonious colouring, they could, however, teach us moderns much, and, no doubt, Oriental as well as Egyptian art had great influence on the Greeks. From the one they got grandeur, from the other delicacy. The Egyptian life was one of the severest despotism—not so was that of the Greeks. Although thoroughly national, their whole mental life was so elevated, so filled with universal human significance, that it constituted the indestructible basis for the development of all future ages, and in the everlasting struggle of the beautiful and the true with antagonistic principles. Having briefly described the country and its principal city, Athens, Mr. Brindley said that Greek ornament might be divided into two varieties—the Early (or Doric) and the Alexandrian, *i.e.*, the severe and florid. The first of these, the Doric, contained little ornament; its style of architecture was extremely massive, one of the best examples being the Parthenon. The next we got was the Ionic, of which there were some good examples in the way of casts. At present, the Architectural Museum might be said to commence with the Ionic. These casts were in the upper gallery, and were chiefly from the Erectheum. Alongside of them were casts from the best examples of more florid work, as, for example, from the Choragic monument of Lysicrates. In speaking of Greek art generally there was one class of ornamental art,—viz., the vases—which was apt to be overlooked, particularly as the Museum tended chiefly to the wants of architecture, and when speaking of these beautiful objects it should be remembered that the Etruscans almost excelled the Greeks in the art of terra-cotta pottery, vase painting, and bronze work. Of such art as this our national Museums contained a mine of wealth well worth study by all who were engaged in decorative and metal work. The peculiarity of Greek carvings was their extreme delicacy, all the outlines being most perfect forms, with the greatest accuracy of drawing, each stone being studied with as much care as if it was of the most costly nature. The casts of this work in the Museum, though few, were quite sufficient to show the wonderful ability of the old Greeks, and, was nothing else handed down to us of Greek art, they would be sufficient to demonstrate that the Greeks were truly a refined people. Closely related as were the Romans to the Greeks, more different brothers of the same family could scarcely be imagined. If one wished to designate in one word in what this strong distinction—one might almost say contrast—consisted, it might be asserted that the Greeks were the people of Art, and the Romans the people of the State. The Greeks conquered the world by their beauty, the Romans with their policy. The Greeks were an idealistic people, the Romans were thoroughly realistic. The Greeks founded states, sent out colonies, and spread their civilisation over distant shores; the Romans had no desire to civilise, but to conquer, and onward they went conquering, till at last they arrived at dominion over the entire known world. In art, the Romans were copyists of the Greeks, and they had never laid claim to higher artistic gifts. Art was with them not the hearty delight of the people, but an article of luxury belonging to the rich and powerful. The immense importance of the Romans, however, as regarded the history of art, rested on their universal domination, for while they laid a common yoke upon all nations, they conferred upon them their art as well as their law books. Roman art, then, was simply an enlargement of the florid Greek. It did not add a single important element to the Greek, but elaborated the established elements with every possible variety of effect, and with all the exuberance and richness of which the people were capable, developing some into comparatively colossal proportions. The casts in the upper gallery, hanging over the Greek ones, could not be taken for other than Roman work; they were taken from various temples and triumphal arches at Rome. Roman art might be said to exist until the time of Constantine the Great, when he removed the seat of Government from Rome to Byzantium. Here, the declining art of the Romans became the garb in which the young and world-agitating ideas of Christianity were compelled to clothe themselves. While the Early Christian age used the antique forms of art from necessity, it preserved for its future greatness those fundamental laws which could be the basis of the new structure, stripping off from the antique art treasures all that might not befit the new ideas, and retaining the healthy germ from which the tree of Christian art was destined to unfold with grand magnificence. In this lies the historical position of Early Christian art. It stood as a mediator between antique, heathenish life, and the art of the true Middle Ages. Its beginning could be traced to the first century of the Christian era, and it reached its close about the end of the tenth century. For the best specimens of Early Byzantine art we naturally looked to Constantinople. From here, as Christianity extended under Constantine, the style extended throughout Europe; and the early churches, particularly those of France and Germany, were very rich in Byzantine work. On the walls of the Museum were hung some fine casts of Byzantine work from various places on the Continent. The peculiarity of work of this date consisted in the treatment of the foliage, which was still of the acanthus type. The variety of the foliage was truly astonishing, particularly in the capitals, where the leaves were generally interwoven, lower ones being connected with the upper, and not detached, as in Roman work, where the bell of the capital might be turned in a lathe and the leaves arranged round separately. The casts of metal work of this style in the Museum were very fine, particularly those from Notre Dame, Paris. In conclusion, Mr. Brindley conducted his audience over the Museum, pointing out the differences in the various styles of ornament of which he had spoken in his lecture.

The fourth and concluding lecture of the series will be given by Mr. Brindley to-morrow (Saturday) afternoon, when the Decorated and Perpendicular (Second or Middle and Third Pointed) casts will be the subject of comment.



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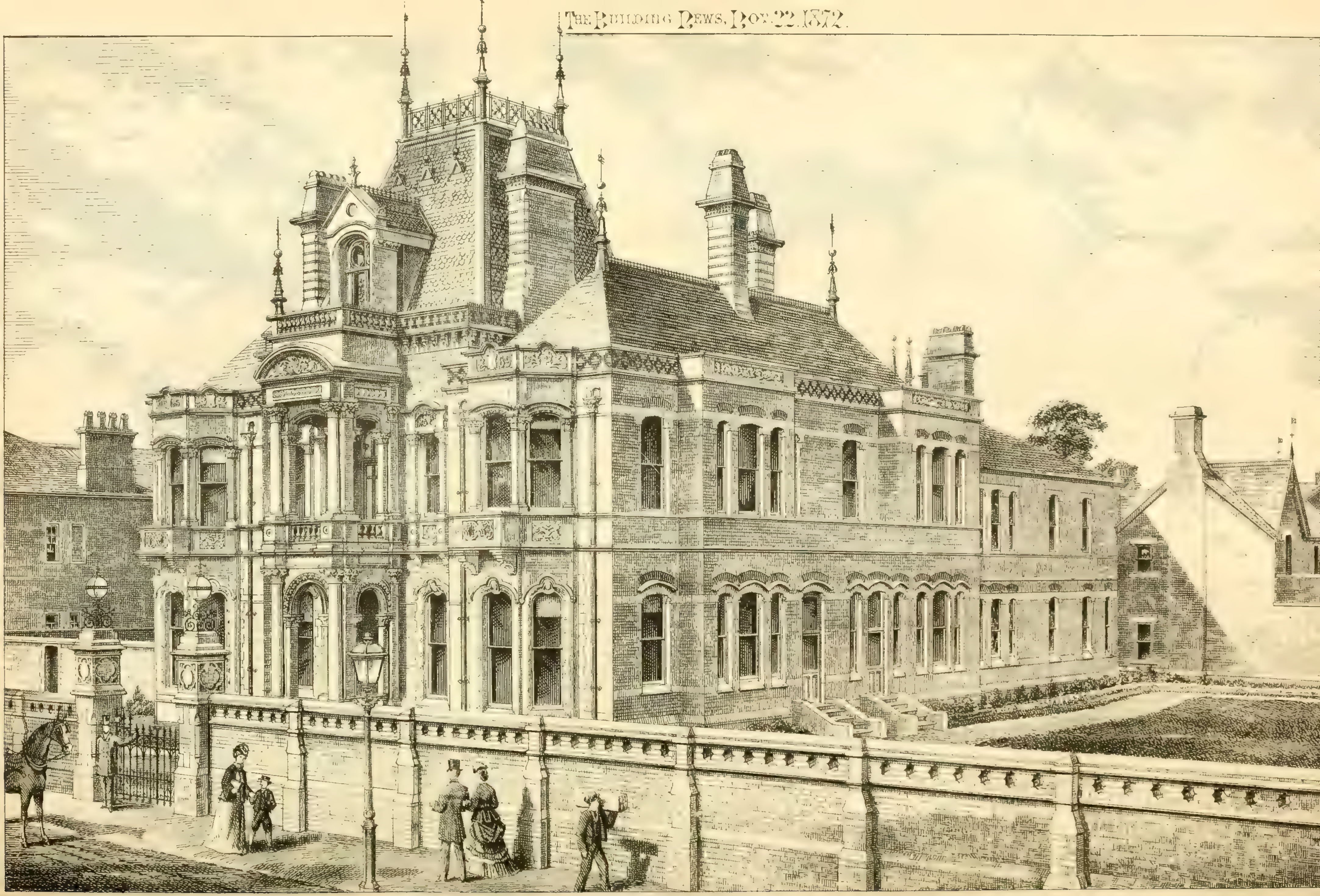

DRAUGHTSMANSHIP v. GENIUS.

THE opinions expressed by your correspondent "G. H. G." in the article upon "Custom and Invention in Art," are too thoughtfully expressed, have, though but slender, still too much foundation in fact, and are too much in harmony with the general tone of the architectural writers of the day, to be passed over with neglect even by those who disagree with them. They are, however, at any rate at first sight, almost diametrically opposed to those which appear in another column of the same—the last number of your journal—in the report of the paper read by Professor Edward J. Poynter, A.R.A., before the Royal Institution. "G. H. G." places himself by his own choice in opposition to Mr. Street, another member of the Royal Academy, and though official authority will bear down sound argument, it is worth while examining whether the view put forward by your anonymous correspondent, backed, as I acknowledge it is, by many of his companions, or that pronounced by Messrs. Street & Poynter, should command our assent. The question is an important one, and deserves careful consideration, since the one party would revolutionise the system of architectural education, and the other would sustain and develope that in existence. Draughtsmanship is the *bête noir* of the former, the sheet anchor of the latter.

Mr. Street directs students to draw and ever to draw again, from the acknowledged best examples of ancient work, and not to turn over a page of the book he is learning until he has thoroughly mastered it, and thus learn his profession—as it were—or, as "G. H. G." puts it—"bit by bit." Mr. Poynter's parallel advice is so pregnant with meaning that I shall quote his own words, "Any attempt to rival or surpass the *chefs d'œuvres* of the past must be made on the same conditions, and in the same spirit, that animated the producers of those great works." "G. H. G." claims to have shown in a previous article that the weakness or proneness of architects to pander to conventions or fashions of thought arises from a defect in modern professional art-training in not developing individual talent and inventiveness. To this again may be opposed the following passage from Mr. Poynter's paper: "I have no hesitation in saying that art has lost more than it has gained by our modern modes of thought and feeling; and that if it be asked why we cannot put away the traditions of the past, and work in the modern spirit, the answer is that the modern spirit is becoming daily more opposed to the artistic spirit, and is precisely what hampers its expression; that what is good in art of to-day is good in the same way, and for the same reason, as the old is good; that we have no lights on the subject which were not also dear to the old masters, and that when we seem to have struck out a new path, we have only chosen one which they purposely and rightly rejected; when we seem to have discovered a new truth, it proves to be one beside the question. The hunt after a Will-o'-the-Wisp which "G. H. G.," Mr. Fergusson, and others, are bravely keeping up, I venture to say they will find, like the alkali station-master's search after his crazy wife, to be "rally as on-satisfactory as anything in life." The new style to be founded upon the requirements of this precious age is a myth to begin with, and inventive talent is not to be concocted in schools, and least of all in schools in which reference to past successful work is to be excluded. Are we to despair of ever again getting original thinkers and writers, because the education at our public schools is not confined to eliminating the inner consciousness of all the hopeless dunces, with a hopeful leaven among them which constitute the rank and file of their classes? The real aim of all study—architectural study included—should be copyism in the first instance to attain what either is, or is equivalent to, draughtsmanship, and there is no occasion, at least on the part of your correspondent's opponents to assert, as he supposes they do, anything to the contrary. Of course, then, the patronage and encouragement afforded by our architectural societies should be unmistakeably in that direction; yet he is in error when he continues, "Prizes and inducements are held out for the best measured sketches and drawings of old buildings—never for the most original idea or method of construction." What is the Soane Medal of the Institute, for instance, offered for? It would be absurd, he says, to expect genius from a study or perusal of the lives of great men, but it would be equally absurd to expect to raise it, like cucumbers in a forcing frame, with no manure but its own, and it is not reading the lives of architects, but studying their works, that is the course recommended. The *bit by bit* policy, with its concomitant slow though sure method of attaining eminence, is what those dislike so much nowadays who, erroneously fancying themselves all to be endowed with genius, wish to secure its fruits in haste, and it chafes them to find the speed less than they expected. We are promised by the same writer another paper upon the undue influence of custom in restricting invention; inventors, however, are an irrepressible body, much given to cry wolf when there is no wolf, and ought not, therefore, to take it amiss, when a small one does appear, that the world is not so ready to come to the rescue as otherwise it might be. But the amusing part of the business is not that we are to take pains to be more appreciative, and to value more than we do the men of genius who make their appearance, but we are to manufacture them ourselves by the gross. Your correspondent's strange parting advice to all artists fettered by custom and conventional training, is to study Mill's "Essay on Liberty." Mine would be not to bother themselves about such stuff, for nobody wants to interfere with them. J. P. S.

[We are not sure that we correctly understand the meaning of the above two concluding sentences, for "J. P. S." has frequently a peculiarly inartistic way of uttering his thoughts. If he means to apply the words, "such stuff" to Mill's Essay on "Liberty," we should imagine that he never read the book. If so, he reminds us of another architect, whose name has been sufficiently heralded of late, and one whom, we believe, "J. P. S." looks upon as teacher and guide. The architect referred to, seeing the word "positivism" in the BUILDING NEWS, actually had the innocence to ask us what it meant! Here was a man who had been so thoroughly absorbed in contemplating the glories of Mediæval times that he knew nothing of Comte and his disciples, and the great and deep intellectual movement they were helping on!—ED.]

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HOW CHURCHES ARE SET ON FIRE.—The stove for heating the parish church of Cargill is being repaired. In the course of their operations it was necessary for the workmen to open up the flue or chimney for the smoke. They found a beam of wood half burnt through and in close contact with a wooden partition. That any tradesman or inspector of works could have committed such a blunder is scarcely credible; but such is the case, and, doubtless, such carelessness is often the cause of fires in churches.

INSTITUTION OF SURVEYORS.—At the ordinary general meeting, held on Monday, November 11, the following names were read and passed to be balloted for on December 9:—As members—William Havard Apperley, Hereford; Henry Parsons, Haslebury Plucknett, near Crewkerne, Somerset; Francis Newman, Ryde, Isle of Wight; John Pyne, Canford Manor, Wimborne, Dorset; Edward Robert Robson, 20, Great George-street, S.W.; William Edward Wright, King's Lynn; George Vulliamy, Metropolitan Board of Works. As Associate:—Albert Low, 3, S. Helen's Place. The following candidate was balloted for, and declared duly elected as Associate—William Seth Robert Payne, 2, Talbot Court, Gracechurch-street, E.C.

LEGAL INTELLIGENCE.

ACTION AGAINST THE VICAR OF FOLKESTONE.—Nov. 14.—(Before Vice-Chancellor Sir R. Malins.)—Corporation of Folkestone v. Woodward. This was a motion on behalf of the Mayor and Corporation to restrain the Rev. Matthew Woodward, the Vicar of Folkestone, from building on any portion of his property within a certain prescribed building line, or so as to reduce the street on his southern frontage to a width of less than 40ft. In 1865 a Mr. Benjamin Andrews conveyed to the defendant and his successors a triangular piece of ground near Harvey-square, Folkestone, as a site for the erection of a church. Shortly after the conveyance the defendant put up a temporary wooden church, where service was performed until the spring of the present year, when sufficient funds having been collected, the temporary church was pulled down, and a permanent church, to be called S. Michael's Church, was commenced. It appeared that the temporary church was removed during the first week in June, and that on the 24th of that month the excavations for the new church were begun, and that the walls were commenced on July 17. The plaintiffs, being under the Folkestone Improvement Act, 1855, and other Acts, empowered in every case where the width of any street should not exceed 40ft. to prescribe the line in which any house to be thereafter built should be erected, on June 17th last passed a resolution "that the width of the several roads on which the proposed new Church of S. Michael will abut must not be less than 40ft., inclusive of the footways." And they subsequently, on August 5th, prescribed the line of building on the Dover-road frontage, so that on the side next to the Dover-road a corner of the new church would project 6ft. over the prescribed line, while on the south side the whole frontage of the church from east to west would project 5ft. beyond the 40ft. limit. The defendant, however, having made some progress with this building, declined to set it back, and the Corporation instituted the present suit.—The Vice-Chancellor said that he was clearly of opinion that a church was a house or building within the meaning of the Act, for otherwise a church might be so built as to obstruct a thoroughfare without the Corporation having any right to interfere. Under their public and private Acts of Parliament this Corporation had extensive powers, and so long as they were within their powers, and did not exercise them in a corrupt or fraudulent manner, the Court could not interfere to control them. In this case it appeared that as the new church now stood there was room for a 24ft. roadway, besides a footway, which would apparently have sufficiently met the public convenience, and with this the Corporation might have rested satisfied; but having determined strictly to exercise their powers, and having attempted to exercise them, as his Honour thought, in an unreasonable and unnecessary manner, they must themselves be treated with strictness. Now they were aware in June, when they passed the resolution of the 17th, that the new church was about to be erected, and they did not tell the defendant that it would be necessary to take any part of this land. The defendant must be treated as the owner of this land, and until the Corporation had exercised their power of prescribing the line of building the owner was at liberty to build up to the limit of his property. They did not exercise their Parliamentary power of prescribing the line until the 5th of August. This was too late, for the defendant had then already made considerable progress with his building, and the motion must, therefore, be refused, with costs.

PAVING APPORTIONMENTS.—The Board of Works for the District of Plumstead sued the Planet Building Society in the Court of Exchequer to recover from the defendants a certain sum of money, the amount of paving rates apportioned to land of which the defendants were the owners. A person named Banks was the owner of the land when the apportionment under the Act was made, but nothing had been recovered or sought to be recovered from him. Banks mortgaged to the defendants, who entered into possession under it, and were entitled to receive rack rents, and this made them owners under the interpretation clause of the 19th and 20th Vic., c. 120. The question to be determined was whether the Board of Works were entitled to sue the defendants in respect of an apportionment made before they became owners? or whether their rights were limited to suing the person who was owner at the time the apportionment was made? The Court argued for the Board, in substance decided that the liability to pay went with the land, and gave judgment for the plaintiffs.

HILL AND ANOTHER v. THE LORD MAYOR AND CITIZENS.—THE HOLBORN VALLEY WORKS.—The Hon. G. T. Thesiger, on behalf of the defendants, recently moved for a rule calling on the plaintiffs to show cause why an order of Mr. Baron Pigott, dated the 25th July last, should not be rescinded, and why the previous order of the 28th June, made by the learned Baron, which was rescinded by the subsequent order, should not stand. The first order, which was made under the third section of the Common Law Procedure Act, was one to refer the question at issue to one of the Masters, and it was supposed to be founded upon the affidavit of Mr. Nelson, the City Solicitor. The second order stated, in effect, that upon hearing counsel on both sides, the learned baron ordered that his previous order should be rescinded unless within one week the parties consented to name an arbitrator with power to make *ad interim* awards in respect to the matters at issue between them. The circumstances of the case were these:—The action was brought by the plaintiffs, who were the contractors employed by the Corporation to execute most of the works connected with the Holborn Viaduct, and it involved a claim of £132,000, and an additional demand of £38,000 for extra expenses occasioned by the defendants' failure to give possession of the lands on which the works were to be executed within the period prescribed by the contract for the construction and completion of the works. The first question for decision was as to the extent of the obligations of the defendants; and the second was whether they were absolutely bound to give possession of the land in question within the time mentioned in the contract, or whether they were only bound to use reasonable diligence in giving up the land to the contractors at the proper time. At a meeting of a committee appointed by the defendants it was agreed to refer this matter to an arbitrator. The particulars of the claim were brought before Mr. Baron Pigott, and the learned judge, having considered the case, said it was certainly a proper matter for reference, but expressed a doubt as to whether it should be referred to the Master or an arbitrator; subsequently the usual order refering it to the Master was made. Shortly after, a summons was taken out to rescind that order, and calling upon the defendants to show cause why, in addition to the rescinding of the order, an order should not be made referring the matter to a special arbitrator, with power to call in an assessor and to make interim awards. Mr. Thesiger, having reviewed all the facts of the case, contended that there was no new material brought before the learned judge to justify his lordship in rescinding his former order. Rule *nisi* granted.

STATUES, MEMORIALS, &c.

EDINBURGH.—A monument to the late Horatio Macculloch, R.S.A., has just been completed by Mr. D. W. Stevenson, from a design by Mr. James Drummond, R.S.A., and erected over the painter's grave in the Warriston Cemetery. The design is that of a Celtic cross. Over a broad step, 18in. in height, rises a square base consisting of a single stone, weighing about two tons. The upper angles are rounded off, and each side is ornamented with a range of arched panels, surmounted by laurel leaf tracery. Over this pedestal is placed a truncated pyramid, on the top of which, again, stands the cross, rising to the height of about 15ft. from the ground. One side of the pyramidal base presents a square panel, within which are sculptured a palette and sheaf of brushes, the latter supporting a wreath of laurel. An arched panel on the opposite side incloses a bas-relief of one of Macculloch's favourite dogs.

MEMORIAL TO THE LATE EARL MAYO.—At Cockermouth, Cumberland, on Wednesday week, a meeting of the subscribers to the above-named memorial was held, when it was agreed to erect a colossal Sicilian marble statue, 9ft. in height, from the design of Messrs. W. & T. Wills, of the Euston-road, London (the sculptors of the statues of Cobden and Sir Humphry Davy), who have represented him in his robes as Viceroy of India. It will be placed on a granite pedestal, and erected in the centre of the town.

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LIVERPOOL PLUMBERS' ANNUAL SOIREE AND BALL.—A *réunion* of the working plumbers and their wives and sweethearts took place on Monday last at S. George's Hall, under the auspices of the Plumbers' Association. About 700 were present, and Mr. P. H. Rathbone presided. During the evening the chairman addressed a few words of kindly advice to those present. He said that the great curse of the English nation was waste. Abroad, the working men made less wages than English working men; they lived in a poorer manner than we did, but yet they enjoyed life more than we did, and that was because they knew how to make money go further than we did. He did not grudge high wages to the handicraft-men, but he did grudge them when they did not work for them. Any man who did what lay before him in the shape of work was really bent upon doing what he could to maintain England as a great nation; and he hoped that they would long continue to deserve the reputation of being the hardest workers in the world. Mr. James Monroe, the secretary of the Association, wished to contradict the rumour that had been circulated that the plumbers had demanded a higher rate of wages, for such was not the case. He read the report, which stated that their list of widows and orphans had increased, but their funds had increased also. After paying the expenses of the last ball, there was a balance of £101; and this, together with the value of the fund previously accumulated, made a total of £117. Out of this sum there had been paid £60 to widows and orphans and disabled members, leaving in hand a balance of £57

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the BUILDING NEWS School Planning Competition is extended to the 30th of November, 1872. For particulars, see BUILDING NEWS, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

RECEIVED.—D. P. F.—J. P. S.—W. B.—Draughtsman.—E. L. G.—J. N.—T. G.—W. & B.—J. B.—M. & T. W.—W. H. L.—J. P. S.—C. F. H. & Co.—C. H. M.

W. W.—The letter came to hand, but it was unsuitable. In using strong words, instead of strong arguments, against distinguished architects, you should at least put your own name.

J. KING JAMES.—Drawings to hand. You used toned paper, which is not so good as white paper for photo.-lithography.

J. P. SEDDON.—Drawing of Great Yarmouth Church to hand. When using tracing-paper for photo.-litho. purposes, you should use French or blue tracing-paper, and not yellow tracing paper.

◆

Correspondence.

SHALL OUR BUILDINGS BE PERISHABLE OR IMPERISHABLE?

To the Editor of the BUILDING NEWS.

SIR,—When it is considered that the labours of the Royal Commission appointed in 1836—nearly 40 years ago—to visit the quarries of this country and recommend a stone suitable for the intended new Houses of Parliament, cost the nation £20,000; that their advice has unfortunately turned out almost entirely useless, as the stone adopted does not withstand the London atmosphere; and that architects are acting at the present time just as if that Commission had never been appointed, I think it will be admitted that it is of the utmost urgency and a professional duty to consider whether some better and more durable building material than any now used in the metropolis can be discovered.

It will be remembered that during last session Mr. Ayrton, in reply to inquiries, stated that he was having decayed stones at Westminster Palace replaced with new ones, and the pinnacles refixed; and in the House of Lords the Archbishop of Canterbury made an urgent appeal to the Government to take immediate steps to preserve Lambeth Palace from further decay, caused by the potteries in the neighbourhood. The Vestry being threatened with an action, their medical officer, Dr. M'Cormack, was requested to report on the subject, and he did so in these words:—"A portion of stone, obtained after several days of dry weather from the Palace, was subjected to chemical tests, and even in the very centre sufficient traces of hydrochloric acid were found to satisfy me that this is the cause of decay." He also stated that the Houses of Parliament opposite were being injured by the same gases, and by others, as the north side of the building was in a state of decay. At Buckingham Palace a year after it was finished large masses of stone were frequently falling from the cornices, to the great danger of the sentries below, and, in the repairs—so little reliance could be placed on the stone—cement was used which had to be painted to match the stone of the building. The details of the Institution of Civil Engineers—a recent erection—have crumbled away. Of ancient buildings, scarcely an original stone remains of the exteriors of the Abbey, Henry VII.'s Chapel, the Temple Church, and others. In short, the examples of decayed stone buildings in London are too numerous to quote without being wearisome. Now, the stone was not originally defective. It had been selected with the greatest care for the modern buildings, and doubtless for the ancient ones. The same material used hundreds of years ago in the village churches in the neighbourhood of the quarries is, with few exceptions, in the same condition to-day as when it left the hands of the masons. A remarkable proof of this durability may be seen at the old Portland quarries, where there are blocks which were quarried at the time S. Paul's was erected. Though 150 years old, they still show the marks of the chisel, while the stone in the cathedral itself (as the Commissioners of 1836 say) is fast mouldering away. The cause and effect of this lamentable ruin and decay are not far to seek. All freestones, limestones, sandstones, and dolomites alike, being soft and absorbent, have no power of resisting the sulphurous carbonic and nitrous acids, the ammonia and unconsumed carbon with which the London atmosphere is charged. In wet and windy weather these are absorbed and driven into the body of the stone, and immediate disintegration ensues. Then there is the mechanical disruption caused by the rapid changes from thawing to freezing. Of course, certain stones are more durable that others, in proportion as they are more crystalline—more granitic—but composed as they are, and with the air of London as it is, the inevitable result is the more or less rapid but not less sure destruction of all freestones cemented by calcareous matter. Portland stone, the use of which was given up some years ago on account of its want of durability, but now again so much used, contains 98 per cent. of carbonate of lime, and 1 per cent. only of crystalline matter or silica. It is, therefore, one of the worst stones for London, and should be abandoned. Another disagreeable consequence of this absorbent quality in stone and of the unconsumed carbon in the atmosphere the rapid blackening and grimy appearance of our buildings. The new Post-office in S. Martin's-le-Grand looks pure and beautiful at present, but how long will this satisfactory appearance last? On this subject, Mr. Herman Merivale, C.B., describing the Crimean monument opposite Dean's-yard, Westminster, says: "The statue, shrine, and capital of freestone are as if they had never been, or, rather, they exist as mere masses of blackness," and Professor Ansted, Mr. Burges, and Mr. Conybeare, the architects, have written in the strongest terms on this point.

Experience has shown that it is hopeless to improve the atmosphere by Act of Parliament. If the smoke and gas from manufactories could be prevented there would still be the fumes from our innumerable domestic fireplaces, and the other effects of hosts of men and animals crowded together in this immense city. The decay of stone was discussed in your columns a few months ago, and better selection at the quarry recommended, but the chemical aspect of the question shows that this would be useless. No one would deny that there is great beauty in carved stone work, but, under these circumstances, would it not be well to reserve it for suburban works? Under these circumstances it will be admitted that it is of the utmost consequence to discover, if possible, some durable material for our more important public buildings. The remedy, then, that I venture to propose is to act as those scientific and practical men, our engineers, do in their bridges, embankments, and other permanent works, and to use granite as a facing for our future public buildings. (For proof of its extraordinary retention of freshness and durability we have only to look at the Crimean Monument, Westminster, the Widows' Fund and Marine Insurance Offices opposite the Royal Exchange, and the Duke of York's Column near the Horse Guards, some of which were erected 20 years ago.) This will, of course, involve a modification of architectural details to suit the material, but I think for general treatment the Early Pointed Transition style of this country would answer remarkably well with the details as indicated below. The present practice and bad effect of inserting bright granite columns, pilasters, and panels here and there in a dirty stone façade should certainly be abandoned. The beauty of granite, like marble, depends upon its being polished, and a building, therefore, must have its entire surface polished. The costliness will, no doubt, appear to be an insurmountable obstacle, and I confess that this difficulty at first appeared to me so insuperable that I did not even attempt to go into the details of the subject; but I have now done so, and beg to place them before you.

It is well known that with the exception of that Cornish variety, from which kaolin or China clay is derived, granite is not only everlasting, but its strength is so great as to resist any weight that, practically, can be put upon it. Mr. Kirkaldy's tests go as high as 25,000 tons on the square inch, whereas no stone resists more than 4,000 tons. It is, therefore, clear and undeniable that granite may be used much thinner than stone for the ashlar casing of a building, without any loss of strength, and that we should be justified in meeting the extra cost by the economical use of the material.

Now, the following prices are taken from "Laxton's Builders' Price Book for 1872," a book accepted as perfectly reliable by architects and builders:—Aberdeen granite, 6s. 9d. per cubic foot; Portland stone, 4s. 9d., including every expense of setting, scaffolding, waste, profit, and carriage four miles from London depot. The labour for the rubbed face of Portland stone is 1s. 5d. per foot superficial. Laxton having no price for polishing granite, I take that of a well-known Aberdeen firm, which is 3s. 6d. per foot superficial. As it is only necessary to show the relative cost of these two materials, a very few figures will be sufficient, especially as the expense of executing carved and moulded door jambs, windows, and cornices, may be assumed to be the same in granite or stone. And for further simplicity, I will take the measurements broadly, irrespective of deductions for doors and windows, assuming these to cover the extra thickness of jambs and angles.

Say, then, that the building has four elevations of about the same dimensions as the proposed Law Courts, we shall have an extent of 2,000ft. by (say) 70ft. in height. If, allowing for bond stones, I average the thickness of the ashlar casing at 1ft., we shall have 140,000 cubic feet, which, at 4s. 9d. for Portland stone, would cost £33,500, of Aberdeen granite, at 6s. 9d., £47,250. If, in consideration of the strength of granite, I reduce this average thickness by one quarter, I secure a saving of £11,812 towards the extra cost of polishing the surface. As seen above, the extra cost per foot is 2s. 1d. 140,000 superficial feet at this price would cost £14,588, from which deduct the above saving of £11,812, and we have £2,776 as the total extra cost of granite for an absolutely durable building as large as the intended Law Courts, which are to cost £750,000. There would also be other sources of economy in the use of this material. No highly paid artistic carvers would be necessary—machinery would be used to a much larger extent than is customary in preparing freestone; and, in giving up the use, as I propose, of large columns, pilasters, &c., and substituting the Mediæval mode of construction, with blocks no larger than one or two men can readily lift, this, by breaking up the polished surface by a greater number of joints, would be an advantage to the effect.

I will conclude with a few remarks on the details which, I think, should characterise a granite structure. It should be plain, simple, and bold in general treatment, with an entire polished surface, and built of comparatively small blocks. It should have no mouldings nor carvings, the great beauty of polished material amply compensating for the absence of elaboration. The arches should be formed of plain or, at most, splayed orders; the jambs might have detached columns, with capitals of simple but elegant outlines, enriched with incised ornament—gilded strings and base moulds would be simple splayed projections.

Every variety of colour desirable could be introduced into these features, Scotland would furnish red, pink, gray, and white, Ireland black, and Cornwall yellow. From Leicestershire and Worcestershire green and red porphyry and syenite are procurable. These colours are not vulgarly glaring, but are sufficiently subdued for the most satisfactory effect, and their variety and depth of tone would enable the designer to produce that relief which is only obtained in a freestone building by deeply cut carvings and mouldings, which collect and absorb the soot of the atmosphere. As to decoration, simple patterns of flat inlay, similar to the Alexandrinum opus of the fourth century, seem to me most appropriate. These would be applied to the faces, splays, or soffits of arches, and to strings—the light colours on dark grounds, and *vice versa*. The introduction, at intervals, of circular and prismatic bosses would be effective. For spandrels and other large surfaces glass and other mosaics would find an appropriate place, and give relief to the deep toned granite of the mass. When particular richness and colour were desired majolica, being probably as durable as granite, might be introduced, particularly in the cornice and upper parts. In first-class works near the base, sculpture, in the Baron Triquetti's manner, as being suitable for execution in granite, would be effective.

Now the whole of the work above described would be imperishable. It could not even be damaged in appearance by soot deposit, but—on the contrary—being polished and smooth throughout, would be cleaned down by every shower of rain.

I believe that such details, designed by competent persons, would amply make up in beauty of effect for the loss of carved stone enrichments. As ancient authority is important to some minds, I may mention that several churches in Florence, Sienna, and other Italian cities, the Jumna Musjid at Delhi, and other buildings, afford examples of the decorations described. Should it be questioned whether a building with an entire polished surface would look well, I may mention that those travellers who have seen the buildings in India, Persia, and Sindh, which are faced with glazed tiles, speak with admiration of their effect. The fact is, the bright surface is only observable when the eye of the spectator is exactly at the same angle to the building as the sun is—which almost never occurs. This is proved on looking at the plate-glass windows of our club houses and shops, which, though brightly polished, do not trouble us.

With the great ability in design which undoubtedly exists in this country, I am sanguine that with the noble and beautiful material proposed, we might combine the refinement and grandeur of Classical architecture with the best features of Mediæval buildings in a manner suited to modern requirements—the result being an edifice imperishable as the Egyptian monuments, and characteristic of the nation.—I am, &c.

Upper Sydenham. HENRY TRAVIS.

ANOTHER SKETCH BOOK.

SIR,—I have watched with considerable interest the correspondence on this subject. The propositions are to the effect that large geometrical details of doors, windows, and other features of secular and ecclesiastical architecture should constitute the sketch-book, and it has been further suggested that general views of buildings should be carefully eschewed.

Now, as a matter of fact, the great charm of a beautiful detail is not so much its intrinsic worth as its fitness, the fulfilment of a legitimate purpose, and its perfect harmony with surrounding objects, so that to be able to set a true value on a door, a window, a buttress, or a pinnacle, it is necessary to have a view of other works in juxtaposition. The most valuable books are those containing general views, further illustrated by marginal details. Simply as an archæological study and a record of historical works, such sketches would, doubtless, be very valuable, but they will be of very little practical use to the architect. If the detail is worth anything, it will not bear alteration, but even if it were desirable to reproduce to perfection an original work, such a circumstance will very rarely occur.

Moreover, the making of these details is likely to cramp the ideas and energies of the aspiring architect, and to imbue into him an intense and undue reverence for ancient work which in these latter days is only too deeply rooted. In narrowing the mind to such matters, one is too apt to lose the outlines, the grouping, and the more comprehensive features of architectural grandeur, and to fall into a style (if it can be called such) of an insipid and slavish copyism. To a great extent this is the bane of the profession, threatening to work out its ruin, or to bring it into contempt. I do not by any means disparage the study of any dead style, but I do say that this sketching business may possibly be carried too far. A man may be a good sketcher, and a clever draughtsman, but a bad architect. One of the most worthy of the Pugin Travelling Students had little or no powers of original architectural design, at least at the time he was engaged as such.

Not only so, but to such an extent and to such perfection has this sketching been carried, that unless the illustrations were exceptionally good, they would reflect no credit on the contributor, or on the BUILDING NEWS. In looking over the "BUILDING NEWS' Sketch-book," I find that nearly one half of the illustrations are large details, such as are suggested for the new book, but it cannot be asserted that they are the most interesting portions of it, so that unless the original propositions are considerably modified, this new idea is not likely to find such favour or possess such interest as some correspondents seem to attach to it.

Should you, therefore, decide not to start a book which must necessarily be a considerable time in compilation, and its merits questionable, I doubt not that you would, nevertheless, very gladly publish in the pages of this paper any sketches or drawings of interesting works hitherto neglected, provided such drawings were of sufficient merit.

Now, it would be much more for the permanent advantage of young men to sketch more from the mind than from historical monuments. A too great indulgence in the latter will issue in a style of lifeless copyism, but a carefully-wrought series of original sketches will help to develope the complete education, acquire enlarged views of composition, effective grouping, liberty of sentiment, and facility of invention, and at the same time accustom the student to the practical phase of the profession—that of original design.

The proprietor of the BUILDING NEWS deserves the hearty thanks of every professional man, but more especially of the younger members, for instituting those competitions which are associated with it. They not only popularise true merit, from whatever source it may come, but bring a pecuniary reward as well, and at the same time shed clearer light upon those portions of architectural design upon which they treat. I look with great interest upon the "School Planning Competition," and unless I am greatly mistaken, the entire profession will not only welcome the publication of the designs, but be benefitted by them. Certainly the "House Planning Competition" was fraught with good results, and I trust you will go on encouraging a noble and honest chivalry in the ranks of the profession.—I am, &c., H.

SIR,—I think the suggestion for a new "BUILDING NEWS' Sketch Book" an admirable one. The first series was a success, but it failed to be practically useful, owing to its consisting chiefly of elaborately etched perspective views. Now, however valuable and interesting these may be, there can be no doubt that a collection of accurate geometrical drawings would be of infinitely greater service to those engaged in the actual study and practice of our art. I feel sure that it would be a great satisfaction to many hardworking and ardent students, in the provinces especially (who are virtually debarred from the advantages presented by the "Architectural Association's Sketch Book"), if they could, through a national medium, such as that afforded by your pages, exchange their drawings with those of other students without the labour or expense of drawing them on transfer paper. The photo.-litho. process as adopted by you would obviate this difficulty. I think, therefore, if you would consent to give the project a trial by announcing another Sketch Book series, devoted specially (if not quite exclusively) to measured drawings (with the scale drawn and not written on them) with no unnecessary etching, you would be conferring a benefit on the profession at large. I do not think it would be practicable or necessary to attempt any classification; indeed, I think suitable drawings might be published as they came to hand. This would give variety and extended interest, and make it really and truly a "Sketch Book," wherein page after page is often filled with entirely differing matters. An index would, of course, be given to render the drawings easy of reference. I do not think the use of the cymagraph should be insisted on. It is a valuable instrument, and should be more fully known and used; but to make its use imperative would be to exclude very many excellent drawings now lying in the portfolios of students all over the country. I think the integrity and *bona-fides* of contributors might be trusted to for making their drawings as accurate as possible. I do not think it would be necessary to offer any prizes, as in the last series. I think no such incentive is needed for obtaining contributions. You might, perhaps, present a copy of the "Sketch Book," when the volume is complete, to each contributor.

Another suggestion: Why should not our leading architects give us now and then working drawings and details of their works, as engineers do in their class periodicals?—I am, &c.,

JOSEPH OSWALD.

3, S. Nicholas Buildings, Newcastle-on-Tyne,
November 19.

CHIMNEYS AND FLUES.

SIR,—If the reasoning of your correspondent "H." as to the chimneys of Cragside be correct, my theories are at fault. Though I could wish he were right as to flues 18in. by 12in. and wide throats being a panacea against their smoking, I fear facts are at variance with his conclusions. Those old fireplaces were constructed for burning wood, and in days when economy in its use was needless; and a wide throat I have found cure a flue over a large kitchen range which, built with a contracted one, had contracted an inveterate habit of smoking. In ordinary cases, however, I think both theory and practice point to small flues and narrow throats as the safest.

Mr. Richardson in his work states that the houses in Belgravia, built by Cubitt, have flues only 9in. by 9in., while others since his time have them 14in. by 9in., and that they can be distinguished from without by absence of cowls and tallboys in the former case and their presence in the latter. Will "H." deny this, or if not how will he account for it? Again, will not the vast stacks he admires conduct starwards most of the heat of a fire less than would suffice to roast an ox? I expect that the Shaw mansion of Cragside is in a neighbourhood where wood can be obtained easily, and that he has calculated upon its use.—I am, &c. JOHN P. SEDDON.

12, Park-street, S.W., Nov. 16.

THE ARCHITECTURAL NEREUS.

SIR,—The Professor of the Arts of Construction at King's College claims for himself the merit of plain speaking, and as a consistent exponent of the doctrines of common sense, he commands and deserves a hearing from those who may not believe altogether in his creed. He would be more likely to be called a practical than a poetical professor, and yet, though we have no intention to accuse him of being a convert to the poetical in architecture, he is not only jubilant and jocose, but quite romantic in his new character of the architectural Nereus. This, perhaps, is one of the conditions imposed on those who are endowed with the gift of prophecy, and accounts for his revelling in godlike fashion at the opening meeting of the Architectural Association about what he is pleased to call the jubilation of the waters. The prophecy is couched in mystic language, as a prophecy should be, and it wants but slight alteration to make it quite orthodox in a prophetical sense.

"When the tide is at the full, when the wavelets leap jubilantly, and the waters cover the whole surface, there are little corners and crannies which remain quiescent, in which the water seems to be flowing the other way, and, seeing which, one says doubtfully, 'the tide cannot have turned.' You place some bagatelle upon the surface, and by and bye you see it floats downwards, slowly at first, but presently a little more swiftly, till at last it is hurried away and forgotten." "The tide shows a predisposition to alter, it knows not whither." "Prepare for the change!"

And then we are to be launched on these troubled waters like Popanilla, but with indifferent drawings and photographs in the place of dried fish and alligator pears, and instead of making for the shores of Vraibleusia, we are to be wafted by the breezes of eclecticism to the land of the architecturesque (?).

The kernel of this big professional nut is that too much attention is paid to drawing, and our studies are not sufficiently eclectic.

Mr. Roger Smith, some time ago, applied Demosthenes' definition of the chief part of an orator to an architect by substituting "drawing" for "action." Professor Kerr's opinion of Mr. Smith's advice agrees with Bacon's of Demosthenes. "A strange thing that that part of an orator which is but superficial, and rather the virtue of a player, should be placed so high above those other noble parts of invention, elocution, and the rest—nay, almost alone, as if it were all in all."

That we should be more eclectic in our studies should be supplemented with Bacon's advice with respect to books: "Some are to be tasted, others to be swallowed, and some few to be chewed and digested," applies most pertinently to architectural styles.—I am, &c., STRAIGHT EDGE.

"CARLISLE LIBERALITY."

SIR,—Under the above heading there appears in your issue of November 15th a letter signed "George Ord," commenting upon the particulars sent to architects, with reference to the competition for the Carlisle Public Hall.

Mr. Ord says "no premium is offered." He is quite correct. Our capital being limited, we do not consider it judicious to offer premiums. The architect who sends the best plans will have the preference, and as there is no premium, the amount thereof will not have to be deducted from his commission, as is usually the case, of which little arrangement Mr. Ord is doubtless aware.

Next, Mr. Ord says, "No guarantee is given that the successful architect will be allowed to carry out the work on the usual terms." Well, no, it did not occur to the Committee that it was necessary to advertise that, having selected an architect, they would treat him in a straightforward and proper manner, and that they did not intend to insult him. They took that as a matter of course. We are perfectly prepared to pay our architect in accordance with the terms commonly accepted by the profession.

As to whether the amount of money is sufficient or not, that is a matter of opinion. I have not much experience in such matters, neither have the Committee whose instructions I have the honour to carry out, but such as we have leads us to the conclusion that whatever sum may be named it is certain to be exceeded by the builder's estimates, between which and those of the architect's, there is, singularly enough, almost invariably, a very wide difference indeed.

Mr. Ord then hopes "the profession may be able to withhold from this tempting bait," whatever that remarkable sentence may mean. Well, at least, I hope Mr. Ord may be "able to withhold," although he is considerably too late in advising his brethren.

Mr. Ord has made a great muddle of my name, but not having the slightest desire to shelter myself beneath his characteristic blundering, I am, &c.,

CHARLES VYNNE, Hon. Sec.

1, English-street, Carlisle, Nov. 20.

Intercommunication.

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QUESTIONS.

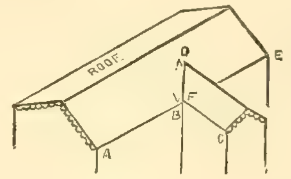
[2695.]—**Half-Timbered Examples.**—Will any correspondent explain the construction, stating scantlings, of one of those half-timbered examples of which so many have been illustrated within a short period in the BUILDING NEWS? If with sketch would be all the more acceptable. State, too, usual limit of corbelling over.—AIDE-TOI.

[2696.]—**Alkaline Tracing Paper.**—I have seen advertised some alkaline tracing paper which is stated to be "as strong as thin cartridge-paper, to be very transparent, to be free from smell, and very easy for working upon, never becoming brittle with age, getting discoloured, or showing any mark in folding." All this for 6s. per quire, double elephant size. Where may it be obtained, and is it what it is "cracked up" to be?—AIDE-TOI.

[2697.]—**Colours to Represent Materials.**—Will any reader kindly inform me what colours architects use to represent the following materials used in construction? Roofing slate, in elevation; ridge tile; eave spouting; flooring tiles; Yorkshire hearths and landings. Also, if the same colours represent the same materials in plan, elevation, and section?—ONE INTENDED FOR THE PROFESSION.

[2698.]—**Batley Market Competition.**—Can you or any of your readers inform me whether this competition has yet been decided, as it is now two months since the drawings were sent in; and, if decided, who are the successful competitors?—A. J. B.

[2699.]—**Construction of Roof.**—Will any of my brother readers give me a little information on the annexed sketch, which I have drawn to the best of my knowledge? 1. How may I construct my roof from D to B to make the spars secure? 2. I want all the water from A to B C to B to go forward to E and downfall pipe. I propose making a wood spout lined with lead to go through roof F below the wall-plate. Shall I do right, or will some one give me an idea?—COUNTRY READER.



[2700.]—**Surveying.**—After the sides and tie-line of a triangle have been measured with the chain only, would any reader kindly inform me the practical method employed by surveyors to calculate the area? Must not the survey be plotted to a very large scale in order to find the perpendicular heights of the triangles with accuracy? In the case of an estate of (say) 100 acres, what is the smallest scale which should be employed? Also, is there no simpler method of calculating the area of a triangle, when the three sides only are given (without plotting), than by the following formula: Let a b and c represent the three sides, s their half sum, and A the area; then $A = \sqrt{s(s-a)(s-b)(s-c)}$?—C. W. F.

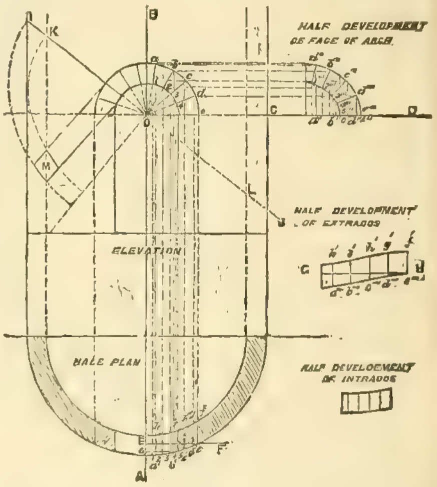
[2701.]—**Gauging Casks.**—What is the practical method generally used in gauging the contents of casks?—C. W. F.

[2702.]—**Patent Fastener.**—In your issue of April 12, 1867, you give illustrations of a patented fastener called "Omnium Fastening." I have endeavoured to obtain one as a sample, and the ironmongers (Crowden & Garrod, of Falcon-square, London) state they know nothing of it, and "cannot find it at the address" I give—viz., J. H. Roberts, Eldon House, Peckham road. Can some one help me?—F. R. N. HASWELL, architect.

[2703.]—**Calculating Earthwork.**—Where can I obtain tables for calculating earthwork according to the principle laid down by your correspondent on p. 488 of the BUILDING NEWS of June 23, 1871?—C. S. R.

REPLIES.

[2669.]—**Circle upon Circle.**—I have seen the very erroneous reply of "T. W. J.," and, what is more, the sweeping assertions of Joseph Riley, who uses a name we may truly and safely honour, and one that will live through ages to come. J. Riley also takes up arms against another class of men. He says, "I greatly object to people teaching a trade they know very little about." In this I agree with him. And he continues thus: "There should be a practical man to each trade [I should be inclined to use the word man in the plural, and say men] and not an art master." Now, I think J. Riley is under a wrong impression, for I do not think that any art master would attempt to teach a trade; while I do think that every trade has its science, and that it is the province of the art master to teach this, and leave the teaching of the trade to those who, like himself, can say "I have tried all ways." But I fear there are few who can make such an assertion, and there are still fewer who could verify such a statement. I am somewhat surprised not to find "J. R." verify his assertion by inserting a drawing showing his system, as I doubt not but it would have been inserted had it contained any merit at all. I inclose a drawing of circle upon circle, showing the plan and elevation, with developments when the arch is parallel, which may be of use to the gentleman who asked the question should he require it for a stone arch, and you think it worth a place in your pages. To find the development of the face of the arch, drop lines from a b c, &c., in the elevation to a' b' c', &c., in the plan, and set off these distances a' b' c', &c., upon the line C D, as a'' b'' c'', &c., and draw ordinates at right angles to it, and intersect those lines by lines projected to the corresponding letter in elevation. A line drawn through the points thus found will be the development of the outer circle of face of the arch. The development of inner circle may be found by the same principle. To denote which I have used figures in drawings instead of letters. To find development of extrados upon any straight line G H, set off the distances a''' b''' c''', &c., and draw ordinates as shown. Draw the line E F and make the ordinates from G H to a'''' b'''' c'''', &c., equal the distance from a' b' c', &c., to the line E F. The distance from e' d', &c., to f g, &c., will be found from e' d', &c., to f g, &c. The development of intrados may be found by drawing a line from 5 to 6 similar to E F, and working on the same principle as for the extrados. To find the joint mould: Now, it is quite clear that if I pass a plane through any of the joints at right angles to the vertical plane of projection, it would pass through the centre of the arch O. Let us, then, suppose I J to represent an edge view of such a plane, this plane, cutting across the cylindrical building, not at right angles to its axis, or parallel to the horizontal plane, would give an ellipse as section. I J would be the transverse diameter, while the conjugate would be from O to the point beyond, which would be equal to the diameter of the cylinder. Find, by the same method, the inner ellipse for the inner wall, cut by the same plane, and the joint mould will be between the two curves, as shown at m.—W. DSS., Art Master.


HALF DEVELOPMENT OF FACE OF ARCH
HALF DEVELOPMENT OF EXTRADOS
ELEVATION
HALF PLAN
HALF DEVELOPMENT OF INTRADOS
K
B
M
O
C
D
G
H
E
F
A

[2672.]—**Sash Pulleys.**—My humble opinion coincides with that of "R. L."—viz., that "these pulleys are frequently, nay, generally [I might almost add universally] put in too small." The diameter *may* be determined "with reference to the thickness of the pulley stile." Let this be 1¼in., and suppose, for example, the weight to be 2½in. diameter, then, after allowing (say) ¼in. clearance for both weight and line, the diameter of required pulley will be 3in. I know of no rule by which the size of line may be determined. Its strength must, of course, be proportioned to the weight of sash it sustains. Let "R. L." determine this by means of experiment.—AIDE-TOI.

[2682.]—**Damp and Sea Salt in Party Walls.**—I would advise "E. L. G." to cement his neighbour's wall, and then to build another wall on his own property, leaving a space of 6in. between it and his neighbour's. Build the new wall with very hard bricks, laid in cement, and cement the face. I would add that the space between the wall should have an opening at each end to communicate wit the external air.—D.

[2687.]—**Water in Cellars.**—If "J. S." let his drains into the dumb well remain, and could sink his dumb well down to a main spring, he would effectually cure it. I did several cellars like it thirty years ago, and have had no trouble with them since. I had to go 6ft. deep from the floor of the cellar.—JAMES GRIST, builder, Midhurst.

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YORK SCHOOL OF ART.—The annual meeting was held on Thursday week. The total number of students who have attended during the year has been 152, being an increase of 19 upon the numbers who attended during the previous year. This increase applies to every class, although the greatest is in that of the artisans. They however, feel it needful to solicit an augmentation of the funds, the balance due to the treasurer of £53 2s. 3d., as reported last year, is increased to £70 8s. 9d.

Our Office Table.

The Belfast School Building Competition.—A number of architects who had submitted plans for the proposed new school buildings in connection with the workhouse waited on the Board of Guardians on Tuesday, in reference to the selection which had been made at a former meeting. Mr. M'Lean, who accompanied the deputation, stated that the gentlemen whom he represented believed that the plans of Messrs. Young & Mackenzie, which had been selected, did not comply with the printed requirements of the Board, and were defective in several important points; while some of the plans submitted by others of the competitors not only complied with the requirements, but were free from the defects specified. He asked that all the plans might be submitted either to the architect of the Commissioners or the Association of Architects in Dublin, so that a new selection might be made. The chairman expressed the opinion that the plans already selected fully complied with the Board's advertisement, and were the best of those submitted. Some of the guardians were in favour of the views of the deputation; but, after some discussion, the matter was allowed to drop.

Preservation of Timber.—The stoves commonly employed for drying wood have a serious drawback. They are closed chambers, heated by air or hot gases, and each time that the temperature is lowered the steam in the oven condenses on the wood, and prolongs indefinitely the operation of drying. M. Victor Fréret, an engineer of Fécamp, Seine Inférieure, France, has designed an arrangement to remedy this inconvenience. In his system the evaporation of the moisture is complete, the requisite hygrometric conditions being preserved to prevent the too-rapid desiccation of the wood—a very necessary precaution. The green wood dried in the stoves of M. Fréret becomes, as it were, indestructible, in consequence of the combination which takes place betweed the pyroligneous acid contained in the wood and the creosote in the smoke. By this arrangement the inventor states that he can convert damp or very young wood, in a few days, into timber suitable for use, and already the arrangement has been employed with success by several railway companies.

Echoes in Public Buildings.—The *American Railway Times* describes a novel method which has been adopted to prevent the recurrence of an echo in the new court-house at Bloomington. A Mr. Carlock suggested that the stretching of small wires at a proper height and at suitable distances would be of great benefit. This was tried, and the effect proves to be a vast improvement. From having been almost impossible to hear a speaker, there was no difficulty experienced in hearing an address to a jury delivered in an easy conversational tone of voice. In any part of the room, from the remote corners to the centre, it was about the same. The theory is, that the wires (so small as to be hardly visible) break the sound-waves and prevent the reverberation, hitherto the chief obstacle and annoyance. Three or four wires only, crossing the room, were found sufficient to effect this wonderful change.

The Whittingham Memorial.—The committee appointed some time since at a meeting of the members of the National Freehold Land Society to collect funds for a memorial of the late Mr. W. E. Whittingham, many years secretary of the society, and secretary also of the British Land Company, have brought their labours to a termination. The amount collected from the members of the National Freehold Land Society and the British Land Company is about £286. From this £25 has to be deducted for printing, postage, &c. The committee have instructed Mr. Gregg, of Ironmonger-lane, to paint in oil a life-sized portrait of the deceased from his photograph. This is to be done at the cost of £21, and when finished it is to hang in the office in Moorgate-street. A silver salver has been purchased for presentation to Mrs. Whittingham, at a cost of £20, and the balance, 200 guineas, was presented to that lady on Saturday week.

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New schools have been erected at Bexley Heath for the accommodation of 150 children, and one to accommodate 100 children in Welling (Bexley parish). Mr. Joseph Hewitt, of King William-street, City, is the architect in each instance.

The Bexley Heath Public Hall and Institute has recently been finished and decorated, the architect being Mr. Joseph Hewitt, of King William-street, London.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Institution of Surveyors.—"On Mines and Minerals." By Mr. Arundel Rogers. 8 p.m.

Architectural Association.—"On Professional Practice." Lecture II. By Mr. T. Roger Smith, F.R.I.B.A. 8 p.m.

Tuesday.—Institution of Civil Engineers.—"On the Aba-el-Wakf Sugar Factory, Upper Egypt." By Mr. W. Anderson, M. Inst. C.E. 8 p.m.

Wednesday.—Society of Arts.—"On Technical Education and the Means of Promoting it." By Thomas Webster, Esq., Q.C., F.R.S. 8 p.m.

Friday.—Architectural Association.—Prize essay "On the Special Characteristics of Mediæval Architecture Obtaining in Particular Districts of the United Kingdom." By Mr. Johnson. 7.30 p.m.

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Trade News.

WAGES MOVEMENT.

Birmingham.—The dispute in the building trade has been settled by the judgment of Mr. Rupert Kettle. His decision is as follows:—"The construction of rule 1, relating to hours of work, is very clear when it is read, as it ought to be read, with the whole of the terms and the arrangements entered into on the 1st of May last, and of which it forms only a small part. By the May arrangement the hours of labour were reduced, and the rate of wages was raised; and also certain minor claims were merged in the increase of wages then conceded. The basis of that arrangement was that 54 hours should constitute a week's work except during three months in winter (six weeks before and six weeks after Christmas), when the week's work should be 50½ hours; the work in the shorter period to commence, where no artificial light is furnished, at seven o'clock in the morning. So far, the rule applies to carpenters and joiners as well as to the other branches of the building trade who were parties to the May arrangement. The furnishing of artificial light is left in the rule quite at the option of the master. If he furnished such light to any branch under the rule, the extra hours worked from six to seven on dark mornings would be paid for at the ordinary rate, as under rule 3. Overtime in the morning must be before six o'clock throughout the whole year, without excepting the three winter months. If the provisions of the rule ended here some of the workmen in the carpenters' and joiners' branch would be better off than others, because it is very easy and often advantageous to provide artificial light for part of this staff of workmen. The bench hands, working in the shops generally at joiner's work, would earn more than those workmen who were employed on the job generally at carpenter's work. It has been, therefore, found, from long experience, that this difference creates jealousy and dissatisfaction amongst workmen employed in the same shop. To prevent this there is a provision at the end of rule 1, that the out-door carpenters and joiners be paid the same as if working in the shop. The application of the foregoing to the existing dispute between the carpenters and joiners I now make as follows:—The employers are bound to pay all carpenters and joiners up to six weeks after Christmas next for the working day, commencing at seven o'clock in the morning; but if any master provides artificial light, and opens his shop at six o'clock in the morning, he is bound to pay his outdoor carpenters and joiners as for a working day commencing at six o'clock, and that whether they are able to work the extra hour or any part of it or not. It is in every case quite optional with the employer whether or not he provides artificial light."

Bradford.—A dispute of three weeks' standing has existed between the Bradford plasterers' labourers and their employers. All the union men were discharged, and other labourers have been obtained to supply their places. The dispute is not about time or wages, but with respect to lodging money paid to labourers casually engaged, and who do not reside permanently in Bradford. Labourers who have residences in Bradford are paid lodging money when called upon to work in distant places. The employers have secured sufficient men to serve their purposes, but a few of the union men who have not obtained work persist in looking after the strangers and decoying them away from Bradford. The consequence is that the men cannot be kept at the jobs, and some heavy works that ought to be proceeded with, such as the new Town Hall, the Yorkshire Banking Company's new premises, add other contracts, are considerably retarded.

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

TENDERS.

Essex.—For the erection of Paglesham Schools, Essex. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	£	s.	d.
Kemp	£330	17	0
Garrod & Cartar	321	10	0
Watts	275	0	0

Essex.—For the erection of Ashingdon Schools, Essex. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	£	s.	d.
Watts	£313	0	0
Saunders	299	0	0
Garrod	289	10	0
Kemp	288	12	0
Cartar	268	10	0

Essex.—For the erection of Rawreth Schools, Essex. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

Saunders	£766
Watts	760
Gozzett	700

Falsgrave.—For the erection of Falsgrave Infants' School, for 190 children, and caretaker's house, for the Scarborough School Board. Mr. William Watson, of Wakefield and Doncaster, architect:—

	£	s.	d.
Estill, Atkinson, & Co. (accepted)	£864	7	0

Kent.—For restoring and reseating Ryarsh Church, Kent, under Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	£	s.	d.	If seats are in pitch pine. £	s.	d.
Cooke	692	0	0	652	0	0
Lane & Son	617	0	0	577	0	0
Clark	589	8	6	534	8	6
Allchin	488	0	0	448	10	0
Bishop	461	0	0	441	0	0

Kent.—For the restoration of Offham Church, Kent. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	Extra for roofs. £	s.	d.	£
Cooke	191	0	0	594
Allchin	209	0	0	545
Day	215	0	0	515
Church	81	4	0	390

Kent.—For restoring S. Mary's Church, Norton, Kent. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	£	s.	d.	If seats are in pitch pine. £	s.	d.
Cooke	684	0	0	644	0	0
W. & G. Denne	646	15	0	625	15	0
Shrubsole	588	0	0	558	0	0
Whiting	590	0	0	550	0	0
Richardson	391	0	0	367	0	0

Kent.—For new vestries, lecture-hall, and boundary-walls to the Congregational Chapel, Burnt Ash-lane, Lee, Kent. Messrs. Osborn & Russell, architects. Quantities supplied:—

Perry	£1616
Myers	1589
Wood	1583
Browne & Robinson	1475
Dove	1475
Pritchard	1466
Downs & Co.	1368
Tongue	1156

Kent.—For the restoration of Downe Church, and for the erection of a vicarage-house at Downe. Mr. Joseph Clarke, F.S.A., Diocesan Architect:—

	Church.	Vicarage.
Adcock & Rees (accepted)	£938	£1425

Leicester.—The tender of Mr. F. Whitfield, Birmingham, has been accepted for the whole of the fireproof doors and fastenings of the bullion and security-rooms in the new buildings of the Leicestershire Banking Company, at Leicester. The same firm has just completed a contract for a number of fireproof doors and shutters for the accountants' offices and board-room in the new buildings of the Midland Railway Company, at Derby.

London.—For the erection of five blocks of industrial dwellings in the Farringdon-road, for the Metropolitan Association for Improving the Dwellings of the Industrial Classes. Mr. Fred. Chancellor, architect. Quantities supplied by Messrs. Curtis & Son:—

Sharpington & Cole	£52500
Ashby & Son	51971
Conder	51730
Brass	50661
Hill & Sons	50167
Dove Brothers	45600
Perry	43117
Adamson	41380
Brown (accepted)	39360
Tall & Co. (concrete)	36285

London.—For rebuilding No. 69, Ludgate-hill, for Mr. Treloar. Mr. W. H. Hayward, architect. Quantities supplied:—

Brachy	£7051
Snell	6389
Perry & Co.	6342
Baggaley	6210
Ashford	6095
Axford	6089
Perry Brothers	5977
Downs & Co.	5975
Browne & Robinson	5925
Sharpington & Cole	5837
Deards	5735
Morter	5673
Elkington	5610

London.—For enclosing-walls and railing to S. Stephen's Church and Vicarage, Walworth Common, London, S.E. Messrs. Henry Jarvis & Son, architects:—

Henshaw & Co.	£570
Downs & Co.	542
Tarrant	527
Shepherd	510
Thompson	488

London.—For alterations to be made to No. 6, Arthur-street East, London, E.C., for Mr. Thomas Bryer. Messrs. Henry Jarvis & Son, architects:—

Henshaw & Co.	£873
Tarrant	782
Carter & Son	769
Shepherd	688
Greenwood & Son	669

LUDHAM.—For the erection of schools and teachers' residence, Ludham. Mr. J. B. Pearce, architect :—

Batchelor	£1315
Hubbard	1165
Wright	1138
Hall	1115
Hawes	1070
Withers	1050
Browne & Bailey (accepted)	1048

NEWCASTLE-ON-TYNE.—For the erection of acid works, jetty, piling, &c., at Scotswood, Newcastle-on-Tyne, for Messrs. Redmayne Brothers. Mr. Gibson Kyle, architect. Quantities supplied :—

Howard & Son	£4790	12	10
Elliot	4530	0	0
Scott	4424	1	0
Lowry	4348	15	0
Simpson (accepted)	4346	2	0

PECKHAM RYE.—For the erection of a house at Peckham Rye Common, for Mr. H. Drake. Messrs. H. Jarvis & Son, architects. Quantities supplied :—

Kent	£2134
Carter	1996
Thompson	1940
King	1880
Tarrant	1860
Shepherd	1840
Marsland	1825
Henshaw	1794
Downs & Co.	1790
Thomas	1780

SURREY.—For the erection of a new rectory house for S. Mary's, Newington, Surrey, including red brick facings. Mr. E. Christian, architect. Quantities by Mr. F. Hunt :—

Harlock	£3315
Gammon & Son	3211
Jackson & Shaw	3195
Longmire & Burge	3175
Timewell	3110
Dove	3105
Faulkner	3095
Ennor	3028
Brass	2941
Newman & Mann	2911
Lathey Brothers	2816
Downs & Co.	2781

TOWER-HILL.—For the execution of the necessary works in diverting the Nightingale-lane and Irongate sewers, for the Metropolitan Board of Works. Mr. J. W. Bazalgette, engineer :—

Ritson & Thompson	£13345
Bloomfield	12950
Webster	12500
Noel & Robson	11800
Penson	11577
Wigmore	10400
Hubbard	8500
Oliver (accepted)	8500
Neave & Son	8259
Bridgman, Nuthall, & West	8109
Walters	7450

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Do.	do.	12 by 6	1 7 6	11s.

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Specimens at Museum of Geology, Jermyn street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

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COMPETITIONS OPEN.

BIGGLESWADE.—For designs for altering and enlarging the Town Hall and Offices. A premium of 20 guineas will be given for the best design.—Mr. T. J. Hooper, Solicitor, Biggleswade, Beds.

CARLISLE PUBLIC HALL COMPANY, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

CHESTER UNION, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Heartland, Clerk to the Guardians, Chester.

CHICHESTER, November 27.—For plans and specifications for the conversion and reconstruction of the West Sussex Company's premises in East street into a club house.—Mr. L. G. Raper, Secretary, West street, Chichester.

LLANELLY SCHOOL BOARD, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £3 per head. A premium of £15 will be paid for the plan approved of.—Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

THE CARLISLE DIOCESAN CHURCH EXTENSION SOCIETY, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs. This competition is open to architects residing in Cumberland, Westmoreland, and Lancashire only.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

CONTRACTS OPEN FOR BUILDING ESTIMATES.

ABERYSTWITH, December 2.—For re-flagging or asphalting the footpaths of the town.—Mr. W. H. Thomas, Town Clerk, Aberystwith.

ADMIRALTY (Whitehall), November 26.—For supplying H. M. Dockyards with chain for rigging, cranes, &c.—Mr. F. W. Rowsell, Superintendent of Contracts.

ADMIRALTY (Whitehall), November 28.—For the supply of tin canisters.—Mr. F. W. Rowsell, Director of Contracts.

BOMBAY STREET TRAMWAYS, Dec. 1.—For the concession of the right to lay down and work for three years, tramways in Bombay.—Messrs. Smith, Fleming, & Co., 17, 18, Leadenhall-street, E.C. Tenders to be sent to the Municipal Commissioners, Bombay.

BRADFORD, November 25.—For the erection of 23 houses on the Shipley Fields Estate, Frizinghall.—Messrs. Hope & Jardine, architects, Exchange Buildings, Bradford.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

BRAMLEY, November 26.—For the erection of two shops and two houses, &c.—Mr. J. E. Leak, Architect, Leak's-terrace, Hunslet, Leeds.

CANTERBURY, December 2.—For a concession of the town sewage.—Mr. R. W. Flint, Town Clerk, Castle-street, Canterbury.

CARDIFF, November 27.—For the construction of a sewer on the western side of the River Taff.—G. Salmon, clerk, Town Hall, Cardiff.

CARDIFF, November 27.—For scavenging and watering the district in two divisions for three years.—G. Salmon, clerk, Town Hall, Cardiff.

CITY, December 6.—For the construction of new sewers in a portion of S. Martin's-le-Grand and S. Ann's-lane and Gresham-street, E.C.—J. Daw, Principal Clerk, Sewers Office, Guildhall.

GREAT WESTERN RAILWAY, December 4.—For the construction of a station at Radley, between Didcot and Oxford.—F. G. Saunders, Secretary, Paddington Station, W.

HAVERFORDWEST, December 16.—For the erection of boys', girls', and infant schools, outbuildings, and boundary walls. Also master's and mistress's residences, &c., to be built at Prendergast.—Michael White, Clerk to the Board, Haverfordwest.

HERMIT HOLE (near Keighley), December 2.—For the erection of a new Wesleyan School.—Mr. George Smith, Architect, 9, Market-street, Bradford.

IRELAND, December 14.—For alterations and additions to Aughrane Castle, near Ballygaar, County Galway.—Mr. Kempster, Architect, Ballinasloe.

KINGSTON-UPON-HULL SCHOOL BOARD, December 16.—For the erection of a block of school buildings in Daltry-street.—D. J. O'Donoghue, Clerk to the Board, Town Hall, Hull.

LANCASHIRE AND YORKSHIRE RAILWAY COMPANY, November 26.—For the purchase of from 20 to 25 tons of old brass tubes.—Mr. William S. Lawn, Secretary, Manchester.

LITTLE BRAMPTON (Salop), November 30.—For the erection of a bridge over the River Clun.—The Rev. W. Jellicorse, Clunbury, Little Brampton, Salop.

METROPOLITAN BOARD OF WORKS (Wandsworth District), November 26.—For the supply of lamp columns.—Mr. A. A. Corsellis, Clerk to the Board, Battersea Rise, Wandsworth, S.W.

METROPOLITAN BOARD OF WORKS (Wandsworth District), November 26.—For the supply of Guernsey granite, Port Phillip and China stone, drain-pipes, sand and gravel, and for the execution of masons' and paviors' work, jobbing works in repairing sewers, also for scavenging, dusting, horse-hire, and cartage.—Mr. A. A. Corsellis, Clerk to the Board, Battersea Rise, Wandsworth, S.W.

MIDLAND RAILWAY, December.—For the construction of stables under the railway arches, S. Pancras Station, London.—Mr. Swain, Clerk of Works, S. Pancras Goods Station.

NEW ZEALAND RAILWAYS, November 28.—For the supply of rails, spikes, crossings, steel clip, fish joints, &c.—Agent General, 7, Westminster Chambers, Victoria-street, S.W.

NORTH EASTERN RAILWAY, December 12.—For the erection of a goods and grain warehouse at Kingston-street, Hull.—Mr. Prosser, Architect, York.

NORTH EASTERN RAILWAY, December 12.—For the erection of a goods and grain warehouse at Lime Kiln Creek, Hull.—Mr. Prosser, Architect, York.

NORTH LONDON RAILWAY COMPANY, December 3.—For the supply of 300 tons of house coal.—Mr. R. S. Mansel, Secretary, Euston Station, N.W.

NORTHFLEET COAL AND BALLAST COMPANY, November 27.—For the construction of a branch railway from the Company's works at Northfleet to the South Eastern Railway.—Mr. H. Brown, 7, Westminster Chambers, Victoria-street, S.W.

READING CORPORATION, December 3.—For the erection of engine and boiler-house, workshop, tank-house, turbine-house, chimney, cottages, boundary-walls, and other works at the Sewage Pumping Station, near Blake's Lock.—Mr. T. Rogers, Town Clerk, The Forbury, Reading.

SURREY, November 27.—For the erection of new stables and other works at Kingswood Warren, near Sutton.—Mr. W. Smith, architect, 10, John-street, Adelphi, W. C.

S. LUKE'S (Millwall), November 25.—For the erection of a parsonage and schools.—Messrs. Hooper & Lewis, architects, Millwall.

SHEFFIELD, December 5.—For the construction of about 9¾ miles of street tramways.—John Yeomans, Town Clerk, Sheffield.

SKIPTON WATERWORKS.—For the construction of a storage reservoir and other works.—Mr. J. Varley, C.E., Swadford-street, Skipton.

SOUTHPORT, December 3.—For the erection of a new public building in Lord-street.—Messrs. Maxwell & Tuke, Architects, Bury.

THE GREAT NORTHERN RAILWAY.—BRADFORD, ECCLESHILL, AND IDLE, AND IDLE AND SHIPLEY RAILWAYS.—(First Contract) Osset and Dewsbury Railway, December 9.—For the construction of passenger station, platforms, waiting shed, and goods warehouse, at Earlsheaton, and large fireproof goods warehouse, offices, entrance gates, and weighbridges, cottages, &c., at Dewsbury. (Second Contract).—For the construction of passenger stations, platforms, waiting sheds, &c., at Eccleshill and Idle. And goods shed, coke stage, engine pits, crane, weighbridges, and other works at Shipley.—Mr. J. Fraser, Engineer, 19, York-place, Leeds.

WAR DEPARTMENT CONTRACTS, November 26.—For the performance of works and repairs to War Department buildings at Sunderland and Tynemouth.—Royal Engineer Office, 12, Princess-street, Cornbrook, Manchester.

WAR DEPARTMENT CONTRACTS, November 30.—For artificers' work at Norwich.—Commanding Officer, Royal Engineer Office, S. John's-green, Colchester.

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BANKRUPTS.

DECLARATIONS OF DIVIDENDS.

M. J. Alcock, Leamington Priors, builder and tool dealer, div. 7d.—E. Jones, Chester, timber merchant, div. 5s.—J. & J. Hills, jun., Milton-next-Sittingbourne, coal merchants and brickmakers, div. 1s.—J. Hills, Milton-next-Sittingbourne, coal merchant and brickmaker, div. 1d.—J. Hills, jun., Milton-next-Sittingbourne, coal merchant and brickmaker, div. 5s.

PARTNERSHIPS DISSOLVED.

Lewis & Gudgeon, Blackburn, builders.—Thicke & Wilson, Norfolk-street, Strand, architects.—Norman & Leaker Brothers, Bristol, slate and marble manufacturers.—Maude & Walker, Shrewsbury, founders.—Thomas Williams & Co., Eglwysilan, Glamorganshire, colliery proprietors and brick manufacturers.—Simon & Archer, Sise-lane, architects and surveyors.—Carverhill & Walker, Sunderland, joiners.—Richards, Copus, & Brazel, Swansea, masons.

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THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 400, published Nov. 22, 1872, contains Articles on:—Telescopic Work for Moonlight Evenings; The International Exhibition for 1872.—II.; Bessemer's Method of Preventing Sea-Sickness; Purifying the Holds of Ships; How to Take Care of a Battery; The Fusion of Platinum.—Artificial Gems; Work in Compressed Air; How Agricultural Labourers Live; An Application of Magneto-Electricity; The Crab a Geologist; The Sand Blast; Aero-Steam Engines; On the Sulphurous Impurity in Coal Gas; The Reasoning Faculty of Dogs; Improved Mechanism for Winding and Setting Watches; Protective Resemblances in Nature; Royal Astronomical Society; Useful and Scientific Notes; Variable Stars; Magnitudes of Polaris and δ Ursæ Minoris; Double Stars; Lunar Aerolites (?) The Moon's Motions; The Potato Disease; Harp; Sidereal Time Indicator; Caves of the Earth; Cotton Spinning; Local Time at Sea; The Barometric Movements of November; Windmill Power; Sliding Seat for Boats; Ventilator for Mines; Pure Cistern Water; Sharpening Saws more Quickly and Uniformly; Method of Chucking Discs; The Polmaise System of Heating; Density of Alloys; Working Wood for Organs; Pianos and Cheap Piano Actions; Bee-Keeping; Evaporation; Primitive Condition of Man; Effect of Lightning on Trees; The New Air-gas; Domestic Telegraphs; Condensed Milk; A New Milk Gauge; Radiant Heat and Hot Air; The Breaking of Mainsprings; Sewing Machines; Horizontal Spectrum Lines; Targets—A Suggestion; Coal and its Cost, Economy in the Use of Coal; Geometric Turning with Excentric Cutter and Overhead Motion; Lumineted Zinc Roofs Analysed; Our Mathematical Column; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents.—Published at the Office of the BUILDING NEWS, 31, Tavistock-street Covent-garden, W.C.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 29, 1872.

BUILDING AND ORNAMENTAL STONES.*

THIS work, we are informed by the author, is the development of preparations made for the delivery of a course of lectures on the subject at the Royal College of Science, Dublin, in 1870-71. Circumstances prevented the lectures being delivered, but Mr. Hull, while arranging his materials, increased his own interest in the subject, and discovering that no work in the English language exists especially devoted to building and ornamental stones, determined on the publication in its present form of the result of his labour. He has certainly made the first attempt to arrange the various kinds of stone on a scientific as well as a practical basis, and his book, though hardly affording sufficient technical information for the use of those whose acquaintance with building stones is for the most part of a practical nature only, may yet be read by them with great advantage. In his arrangement of his subject, Mr. Hull commences with granite, and is naturally led onwards to the allied rocks, such as syenite and porphyry, and from these to the Plutonic or Volcanic rocks. After these the metamorphic serpentines and marbles form a transition series through the simpler and rarer ornamental stones into those adapted for building and of aqueous formation. The more theoretically accurate plan of adopting, as the principle of classification, the mineral basis of different rocks, would have proved less easy of reference, and less useful in an architectural point of view; while a purely architectural arrangement appeared objectionable as necessitating the classification, under the general heading of "freestones," of sandstones and oolitic limestones — essentially distinct in formation and mineral composition; and again, under the head of marbles, crystalline limestones, serpentines, and even granites.

Granite exists in considerable variations, the most generally-admired varieties being those like the Peterhead, of a rich pink colour, arising from the predominance of rose-coloured felspar. Its closeness of texture, and the large size of the blocks in which it is quarried, are additional recommendations. It is composed of red orthoclase, albite, black mica, and quartz, and is considered by Dr. Haughton to be of eruptive origin. The large tazza and pedestal in the hall of the Practical Museum of Geology, London, made by Messrs. Macdonald & Leslie, of Aberdeen, is a successful example of this material, seconded, as it is, by the excellence of the workmanship. Aberdeen granite is of a grayish tint, according to Haughton of metamorphic origin, and probably much more ancient than the Red Peterhead. It is composed of quartz, orthoclase, oligoclase, and black and white mica, and is similar in composition, but not in colour, to the Norwegian and Donegal granites. Kircudbrightshire granite, largely quarried in Craignair and Creetown, is of a grayish colour, and generally porphyritic. Strontian (Argyleshire) is a medium-grained gray variety, consisting of quartz, oligoclase, white felspar, and black mica in abundance. The central mountain group of the island of Arran is composed principally of granite of two varieties, coarse grained and fine grained, but very similar in composition. The Isle of Mull produces the fine pink and red granites, and granite is also obtained in Scotland from Portsoy in Banffshire, Dalmore, Sutherland; Oban, Breadalbane; and Tiree in the Hebrides. In England granite occurs in but a few localities. Devonshire produces several varieties, principal among which ranks the well-known Cheesewring; there are also quarries at Fremator, near Tavistock, and at Blackenstone, Dartmoor. The granites of Cornwall are remarkable for their extreme variableness in quality, structure, and composition. The principal quarries are at Liskeard, Lamorna, Penryn, and Mill Hill. The stone from the Penryn quarries is of excellent quality. Large quantities of granite have been raised from the quarries of Mount Mado and La Perruque, in Jersey, and also from Guernsey and Herm. The syenitic granite of Mount Sorel, Leicestershire, is highly esteemed for its warm rose tint and extraordinary hardness. Lundy Island, and Shap (Cumberland), are the only other localities in England where granite is quarried to any important extent. It is found in Ireland in Donegal, Galway, Wicklow, Wexford, Newry, Carlingford, Belleek (county Fermanagh), and Arranmore and Tory Islands. On the Continent, France largely produces granite, which is very extensively employed throughout Normandy as a building stone. A handsome porphyritic variety is also found at Laber, in Brittany, and a red granite, taking a good polish, comes from Avallon, near Auxerre, in the department of Yonne. In Italy, the most important quarries are those of Fariolo, near Baveno, on Lago Maggiore. The stone is of warm pinkish tinge, and is quarried in huge blocks, up to forty metres in length. It has been largely used in building Milan, Florence, and Turin. The Sardinian and Elban granites have been somewhat extensively employed along the western shores of Italy; they are of a gray or slightly pink colour, and consist of white felspar, quartz, and black mica. Granite forms a portion of the higher altitudes of the Pyrenees, the Western Alps, and the Carpathians; it also occurs at Brixen in the Tyrol, in the higher elevations of the Riesengebirge, as well as in portions of the Harz, the Thüringer Wald, the Odenwald, the Shwarzwald, and the region north of the Neckar. It is found largely in Denmark and Sweden, and in Gothland and Finland.

The granite of Syene occupies large tracts in Upper Egypt, between the first cataract and the town of Assouan. It was quarried at least three thousand years ago, and fashioned into monuments which have lasted with but little injury to the present time. The Egyptian granite, when once recognised, can hardly be mistaken for any other variety, and must be allowed to be the most remarkable of all building stones. Its durability and other characteristics are too well known to need description. In America, granite is largely developed in some portions of the Rocky Mountains, and in the north-eastern portions of the continent. Massachusetts, Rhode Island, New Hampshire, and Maine, are the principal sources of supply in the United States; it is also extensively quarried in Lower Canada, Nova Scotia, and New Brunswick. In India, granite occurs in the high altitudes of the Nepal Himalayas, and also in other parts.

Syenite, according to the views of most British geologists, is a crystalline granular aggregate of quartz, felspar, and hornblende, differing from granite only in the substitution of the last-named mineral for mica. Porphyry, as the term is now generally received, is a rock of Plutonic origin, with a compact or microcrystalline, felspathic base, in which individual crystals of quartz or felspar, sometimes with other minerals, are developed. In Scotland, porphyries are found embedded with the Lower Old Red Sandstone of the Sidlaw and Lammermuir Hills; with the Upper, in the Pentlands and near Lesmahagow. Cornwall is rich in porphyry, one of the best being that from Luxullian, known as Luxullianite, from one huge mass of which is formed the Sarcophagus of the Duke of Wellington in S. Paul's. Many other localities are almost equally well known, such as Mayon, Barton, Ennis, Chasewater, and Boswednon Cliff, near Lennor. In Ireland, at Lambay Island, off the Eastern Coast, a very handsome porphyry is found scarcely inferior to the "verde antico" of the Continent. It consists of a dark green base, in which numerous light green crystals of orthoclase felspar are distributed. The porphyry of Egypt, like its granite, is the most celebrated, and from very distant times was graven into huge statues of deities and sphinxes. With the decline of the Roman Empire, the art of cutting and polishing porphyry was lost, but was revived at Florence under the De Medicis.

We pass over the information given on greenstones, augitic rocks, and lavas, to glance at the author's remarks on serpentinous stones, in their varieties classed by mineralogists under the heads of: (1) Precious or noble serpentine, comprising the purer translucent and massive varieties, with a rich oil green colour; (2) common serpentine, or the opaque varieties forming rock masses like those of the Lizard, Portsoy, Anglesea, and Zoblitz; (3) fibrous serpentine, including valtinorite, crysolite, picrolite, and metaxite; (4) foliated serpentine, comprising antigorite and marmolite. The serpentine of the Lizard, Cornwall, has been brought very prominently into public favour during the last thirty years. It is extremely variable in colour. The principal mass is of a deep olive green, variegated by veins or bands and blotches of rich brownish or blood red, mixed with lighter tints; another variety has an olive green base striped with greenish blue steatite veins; a third has a deep reddish brown base studded with crystals of diallage shining with a metallic lustre from a polished surface. In Anglesey, greenish serpentine, sometimes slightly reddish, occurs, and a brecciated serpentinous marble with veins of white calc-spar is found at Tregala, near Llanfechell. The serpentine of West Galway—"Connemara marble" as it is called—is a very beautiful stone. There are two varieties, one of a dense opaque and uniformly deep green colour, the other occurring in the form of bands and laminæ, often twisted, of varying shades of green, interlaced with bands of white calcite or crystalline dolomite. Portsoy, Banffshire, in Scotland, produces a very rich and varied serpentine, which does not appear to be in so much request as it deserves.

Serpentine is distributed extensively on some parts of the Continent—in Saxony, Moravia, the Vosges Mountains, and the Alps. In France one of the handsomest varieties has been quarried since 1851, at Saint Veran (Hautes Alpes). It is an ophicalcite or breccia of serpentine, embedded in carbonate of lime of a light green colour, and is extensively used in Paris for decorative purposes. Italy is very rich in serpentinous rocks, much information respecting which is to be found in an account drawn up by M. Rondelet, and more recently by M. Delesse for the Paris Exhibition of 1855. The chief sources of supply are Susa, in the Alps of Piedmont, Val Sezia, Val di Pegli, Pietra Lavezzara, near Genoa, and Prato, near Florence. The verde antico serpentine is probably of no special description, but the name applies to many varieties of green serpentinous rock used by the ancient Romans, sometimes brecciated, or variously veined, and derived from various sources. These, extracted from ruins, have been recut and used in modern buildings. In Spain an ophicalcite occurs, almost peculiar to the country, known as "ophicalce petrosiliceuse."

Marble under some form or another is found in all the great limestone formations. Great Britain, while lacking white statuary marble, is rich in coloured varieties, derived from the Devonian Carboniferous, Purbeck and Wealden formations. The Devonian marbles are abundant and diversified, and are now largely used for chimney-pieces, columns, pilasters, &c. The Purbeck and Sussex marbles have generally fallen into disuse, being inferior both in richness of colouring and durability to the more ancient and crystalline marbles. The marbles of Derbyshire are all derived from the carboniferous limestone, as are also those found in the Isle of Man. Anglesea contributes a very beautiful marble, apparently formed by a combination of crystalline, limestone, and serpentine, called Mona marble. Ireland produces a number of handsome marbles of all colours, and several interesting varieties are found in Scotland. Spain, Italy, and Greece are the countries most rich in marbles. To Italy is recourse still had for that pure white crystalline kind, alone suitable to the higher kinds of sculpture. The most valuable of all the Italian marbles are those of Carrara, Massa, and Serravezza; they stand unrivalled, except by those of Paros and Pentelicos.* A peculiar and little known variety of marble, known as "Pavonazetta" or "Phrygian" marble, is met with in Southern Italy; it consists of banded layers of silicious limestone of various shades of green, alternating with others of pure white, contorted, waved, or foliated in a remarkable manner, and in some cases broken through by little "faults." A pillar of this marble was observed by Mr. Hull among the ruins of Pompeii, and the columns standing on the north side of the Forum Romanum, now converted into a porch for the church of S. Lozenzo di Miranda, attest its use at the commencement of the Christian era. On the American continent the crystalline limestones of the Laurentian series of rocks yield in Canada white marbles suitable for decorative purposes. These are quarried at Calumet Falls, on the Ottawa, Portage du Fort, and Fitzrevy Harbour. Pure white blocks are obtained from Elzivir and Marmora, and Barrie yields a statuary marble little inferior to that of Carrara, did not grains and specks of quartz and tremolite detract from its excellence. Gray and dark gray varieties are obtained from Madawaska, in Macnab County, and a rich red specimen is found among the Quebec series of strata at S. Joseph, on the Chandiere. Marble occurs but sparingly in the eastern states of British America, but some coloured varieties are found in Nova Scotia. In the United States statuary marble has been quarried, but not equal to that of Europe. In Massachusetts some good decorative varieties are found, also in Vermont, New York, Rhode Island, Maryland, and Philadelphia. A black marble, largely used, comes from Shoreham, Vt., Isle la Motte, near Pittsburg, and Glenn's Falls, near New York; and gray and dove-coloured marbles are common throughout the Western States. Egypt is still famous for its Breccia de Verde, found between the Red Sea and the Nile (lat. 26° 8′ N.), one of the most ancient and perfect specimens being the sarcophagus supposed by Dr. Adam Clarke to have contained the body of Alexander the Great. The celebrated onyx marble, only lately rediscovered, and the "Oriental alabaster," with which the former has often been confounded, are also both derived from Egyptian quarries. Palestine, Persia, and British India all possess marble quarries yielding material of good quality.

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* A Treatise on the Building and Ornamental Stones of Great Britain and Foreign Countries. By EDWARD HULL, M.A., F.R.S. London: Macmillan & Co.

Several chapters are devoted by Mr. Hull to Alabaster, Fluor Spar, Rock Crystal, and Malachite, but we must pass on to those dealing with the varieties of limestone so largely employed as a building material. The limestones principally used in the British islands are derived from the Carboniferous, Permian, and Oolitic formations. Of these the two last are the most valuable. Among the best known English quarries are those of Mansfield, Bolsover Moor, Anston, Brodsworth, Cadeby, and Park Nook (near Doncaster), Huddlestone (near Sherburne), and Smawse (near Tadcaster). The principal oolite quarries are at Bourton, Broadway, Ginting, Stanway Hill, Cleve Cloud, Painswick Hill, Sheepscomb Hill, Syreford, Brockhampton, and Loughborough. The Great or Bath Oolite has a much more extensive range. The most important quarries are those in Somerset and Wilts, which are too well known to need mention. The formation also ranges throughout portions of Oxfordshire, Northamptonshire, and Lincolnshire. The Coralline Oolite is comparatively limited, being interrupted throughout a large section of its course from Dorset to Yorkshire. It but seldom produces a good building material. The Portland Oolite is largely in request for that purpose on account of its hardness and durability in presence of a smoky atmosphere, and numerous well-known examples of its use will occur to all.

The sandstones used in building are chiefly derived from the Old Red or Devonian sandstone, the Carboniferous, and the Triassic. They are composed of grains of quartz and other material of variable size, cemented together by silica, carbonate of lime, or oxide of iron, pressure and a high terrestrial temperature often appearing to be the chief agents in their consolidation. They are often highly porous, and consequently capable of absorbing large quantities of water. Variable in colour as in texture, they range from various shades of purple, red, brown, yellow, and gray, into pure white. In England, they occur abundantly, and are sometimes of excellent quality. The quarries are too numerous to name.

We have only space left to glance at the concluding remarks of Mr. Hull on the selection of building stones with regard to climatic and atmospheric influences. Humid or wet climates are most trying to buildings the materials of which are of a porous nature, and the presence of smoke in such countries, or of sulphurous, hydrochloric, and other acids, powerfully aids the destructive influences of rain or damp. For use in such climates, limestones—especially soft, granular, and porous kinds—should be avoided. The best kinds for use are silicious sandstones. Beyond general principles, due care is imperative in the selection of the stone, or there can be no security for the durability of the structure. No more notable instance of the neglect of this precaution can be mentioned than the condition of the Palace of Westminster.

We must not leave the book without regretting that we cannot reproduce a very full and valuable table constructed by Mr. C. H. Smith, giving the weights of a cubic foot of specimens of all the building stones in use in this country.

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* See p 299, ante

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WATER POWER.—III.

THE original form in which use was made of water in motion to do mechanical work was that of opposing to the force of the current of a river a series of float-boards placed round a wheel. In Ewbank's historical account of machines for raising water he describes the tympanum (Fig. 1) used by the Romans, and so called by them from its resemblance to a drum; but a similar form of wheel had been used in more ancient times. It had a hollow shaft, or axle, and the arms proceeding from it to the circumference of the drum were bent up at their ends, and formed so many scoops, which, when the wheel was turned round, gathered up each its portion of water, and as each arm came to a horizontal position the water was shot inwards and entered the hollow shaft, and, one end only being open, the water was discharged from it and led away.

This machine was greatly improved in the early part of last century by M. De La Faye, a member of the French Academy of Sciences, who "developed by geometrical reasoning a beautiful and truly philosophical improvement." Quoting from Belidor's description of De La Faye's reasoning Ewbank gives it thus:—"When the circumference of a circle is developed a curve is described (the involute), of which all the radii are so many tangents to the circle, and are likewise all respectively perpendicular to the several points of the curve described, which has for its greatest radius a line equal to the periphery of the circle developed. Hence, having an axle whose circumference a little exceeds the height which the water is proposed to be elevated, let the circumference of the axle be evolved, and make a curved canal, whose curvature shall coincide throughout exactly with that of the involute just formed. If the further extremity of this canal be made to enter the water that is to be elevated, and the other extremity abut upon the shaft which is turned, then in the course of rotation the water will rise in a *vertical direction*, tangential to the shaft and perpendicular to the canal, in whatsoever position it may be." As given by Belidor (Fig. 2) it has four arms, but Ewbank says that it is frequently constructed with double that number.

FIG. 1

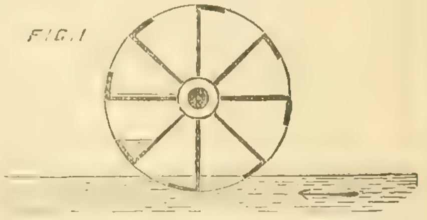


FIG. 2

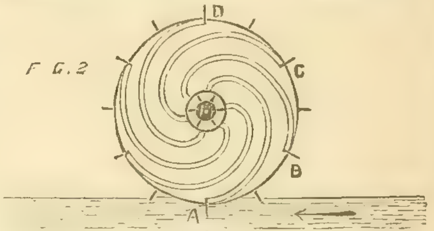
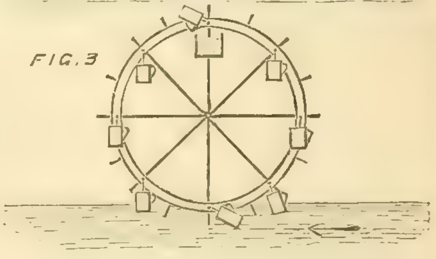


FIG. 3



Dr. Olinthus Gregory, in his treatise on "Mechanics," after describing this same machine, says: "Thus the action of the weight, answering always to the extremity of a horizontal radius, will be as though it acted upon the invariable arm of a lever, and the power which raises the weight will be always the same; and if the radius of the wheel, of which this hollow channel serves as a bent spoke, is equal to the height that the water is to be raised, and consequently equal to the circumference of the axle or shaft, the power will be to the load of water reciprocally as the radius of a circle to its circumference, or directly as 1 to $6\frac{1}{4}$ nearly." The wheel being turned by the impulse of the stream acting upon the float boards, the orifices, A, B, C, D, &c., of the curved arms dip, one after another, in the water, which runs into the channels so formed, and as the wheel revolves the fluid rises in them vertically and enters the hollow shaft, from which it runs out in a stream at either end.

This form of wheel can only raise water to the height of half its diameter, but the "Persian Wheel" (Fig. 3) takes it up nearly to the full height of its diameter. Buckets are hung upon pins projecting from one or both sides of the wheel, and when they arrive at the top they are emptied by coming in contact with the trough, which conveys the water away. For this purpose they are furnished with bowed springs, which come in contact with a fender at the side of the trough into which the water is discharged, and so the bucket is tilted up and emptied, and swings down again to its vertical position.

The power of such wheels as these is measured by the area of the float-board and the velocity of the current, combined. The velocity is most easily ascertained by means of floats, which are sometimes of wood, painted white and loaded with lead until the upper surface stands nearly level with the surface of smooth water; but, perhaps, spheres are better, of some material which displaces nearly, but not quite, its own bulk of water, as offering less obstruction to the action of wind. Oranges are sometimes used.

Having ascertained the surface velocity of the stream, the inquiry would be—what produces this velocity? It is the force of gravity acting on a mass of matter which possesses the quality of fluidity; and water is drawn to the ocean from its source by that power, and is interrupted in its course thither by being employed to turn wheels, or otherwise to transmit the force inherent in it to the work to be done. The surface of a stream of water may be considered as an inclined plane, reversed, down which moves the body of water. When water enters a river or stream, time must elapse before that portion of the river or stream below the point at which the water enters becomes *in train*. A river is in train when the inclination of its surface does not vary, while its hydraulic mean depth remains constant; and it may be said to be in progressive train and in retrogressive train when the inclination and hydraulic mean depth increase gradually and decrease gradually, respectively. For instance, after the flood waters of the upper part of a river had ceased to flow into it, it would not become in train until all that water had spread its influence over the lower part of the river; but after that it would continue in train until it should be again influenced by additional water. Whenever that might occur, if the quantity were to run in gradually until it were exhausted, the river would be put into a state of progressive train, and if, by reason of no more water running into the river until that which had run in had run out, the river would be in the meantime in a state of retrogressive train; and so the regimen of the river might fluctuate gradually in this way; but it is seldom that this regular influx and efflux take place. The regimen is usually interrupted by intermediate additions of water, so that, except in dry weather, it is not easy to ascertain when a river is or is not in train, and the alternative is to observe to what level the surface marks in summer, excluding excessive droughts, and to call that the summer level. The river is at those times "in train." Taking the surface of the river, then, when it is in train, the water drawn along it by the force of gravity may be said to move along the inclined path of its surface reversely, for the same reason that a solid moves down and upon an inclined path; and that, of the laws governing the two cases some are applicable to both, while others are applicable to each respectively.

If an inclined path down which a solid body might move were perfectly smooth, there would be no sliding friction, and as soon as the limiting angle of resistance to the friction of stability should be attained, the solid would shoot down the incline with an accelerating velocity. In a river the water is not perfectly fluid, but has some viscidity. If it were a perfect fluid it could not be retained in its channel, and no state of the river such as that we call "in train" could be maintained.

It is sometimes said that it is "fortunate" that water decreasing in temperature below about 40 degrees Fahr., expands, and that when it is converted into ice the specific gravity is so much less than that of water that it floats upon it, otherwise that the whole would become a solid mass of ice. It may be said to be equally "fortunate" that water is not a perfect fluid, otherwise it would all run out of the river in a glut, and no permanent stream could be maintained.

When water is gathered together in a stream and descends towards the sea, it does so with a velocity the square of which is proportionate to the inclination of its surface, combined with its hydraulic mean depth, the mean velocity of the whole body being in general 8 or 9 tenths (according to the roughness of the bed) of a mean proportional between its hydraulic mean depth and the fall of its surface in two miles. Water flowing in the axis of a stream goes down with greater velocity than that near the sides, which shows that, although we say water is a perfect fluid for all practical purposes, it yet possesses some viscidity, for its outer portions hang to the ground over which it runs, and the velocity increases from the bottom upwards and from the sides inwards, until the maximum velocity is attained in the axis of the river; and it is even observed in parts of some rivers that there is a reverse current near the shore, running up the river. Between this upward current and the main downward current there are eddies. There are also eddies at some distance upwards from the point of observation of the shore water, at which point it turns downwards again and gets into the main stream. The velocity is greatest in the axis because the channel is there the deepest. The axis need not be in the centre of the river, for it is its main channel, wherever that may be; and the velocity is there the greatest, because at any point of the depth—whether at the point where the mean velocity takes place or whether at the surface—it is further removed from the retarding influence of the bed. The motion is due to the attraction of the mass of the earth, and it finds the readiest way to the lowest point continually. It must fall. The velocity it requires in falling is the measure of its force. It rolls with an involved motion, the moving particles at the surface being continually replaced by those from below and from the sides. All these things show that water is not a perfect fluid, but that it has in some degree the quality of viscidity.

We do not adduce these as arguments merely in proof of the viscidity of water, for that can be proved in a much simpler way by letting a drop hang from the end of the finger, or, more noticeably, by taking a drop of water between the thumb and finger, and drawing them apart, whereupon it will be perceived that the drop of water can be elongated. The force required to elongate it, or the force required to overcome its power of cohesion, is so slight that it cannot be measured, but that it does require some force, there can be no reasonable doubt. If it were a perfect fluid, it would fall immediately from our hand, and there would be no such thing as a "drop" of water.

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OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

THE second walk this Term took place on Saturday week, when Jesus College and Carfax and S. Peter-le-Bailey churches were visited. Jesus College was described by the principal, and the members then proceeded to Carfax Church, where the rector gave a brief outline of the history of the church. He pointed out that that church, which was dedicated to S. Martin, was the first parish church in Oxford of which they had any record. In 1032 King Canute transferred the advowson of the church to the Benedictine Monastery at Abingdon, and it was probable that for some time afterwards the monastic clergy officiated in it. The font was then inspected. Mr. Parker considered it a very fine specimen of fourteenth century work. He said that that and the tower were, he believed, the only remains of the old church. Some little time having been spent in inspecting some very old registers of the church, the party proceeded to S. Peter-le-Bailey Church, which will shortly be taken down for the improvement of the street. The ancient fabric fell down in 1726, and the present building was completed in 1740. Canon Linton, the rector of the parish, and Mr. James Parker gave a brief history of the church. There was but little to say about it, and Mr. Parker observed that the less said the better. It is one of the ugliest churches ever built, and its removal will be a source of great congratulation.

CUSTOM AND INVENTION IN ART.

A FEW words in reply to "J. P. S." I am well aware the views I have written are not very popular or palatable with many of the profession, and are in direct opposition to those entertained by a large number whose ideas are cramped by a fashionable patronage. "J. P. S." is one of this class, probably, although he admits that there is "some foundation" for the views expressed. Still, there are some, I am happy to say, not so blinded by interest or custom. I am not at all surprised that "J. P. S." finds me diametrically opposed to two Royal Academicians, but "J. P. S." should know that majorities and official magnates are not always in the right.

"J. P. S." is under the common error of those, the slaves of conventional custom, who fancy any attempt to break through it, sacrilege, and brand the innovators as deluded visionaries. He believes a new style to be a "myth" and "inventive talent" such a rare thing "not to be concocted in schools, and least of all in schools in which reference to past successful work is excluded." He draws upon his own imagination here, in alluding to schools, as I never mentioned a school in connection with inventive talent; in fact, the history of inventive genius is rather the history of untrammelled, unlettered thought, of eccentricity. Lord Macaulay somewhere says the rudest nations, the unlearned vocabulary of uncultivated society, have been most productive of poetical genius. The reason is obvious. Nations, like individuals, are first poetical, then philosophical, and though the vivid impressions of childhood may lose themselves in the maturer faculty and age of reason and generalisation, it is clear no mere reference to past examples can compensate for thought. Mental power is often clogged by excess of learning of this sort.

The quotations from Professor Poynter's lecture do not touch my argument at all. They apply to the imitative arts, as "J. P. S." will find, not the *creative*, as architecture. It is true the "modern spirit" is opposed to the "artistic spirit" in the same manner as modern is opposed to ancient thought; but to fancy a falling back on ancient art is what we want is childish—it is simply copyism, and so long as we are content to follow the traditions of the past it is impossible to advance a step. But if the term "art," as used by Professor Poynter, is understood by him to convey the "archæo-graphic" (if I may coin a word) meaning of the fashionable draughtsmen's school, such an assertion may pass. True art is *inventive creative*, not in any sense transcriptive, and it is for "J. P. S." to show that draughtsmanship or copying old building *is* architecture. If he can show this, and that drawing is anything else than the mere penmanship or instrumental part of an architect's education, or that the "bit by bit" method is a rational method, and is *not* doing mischief by making narrow-minded specialists instead of competent, vigorous, large-minded artists—those from whom he differs will be more prepared to listen. At present his assertions are unconvincing. If "the real aim of all study is copyism in the first instance," as "J. P. S." asserts, it is not surprising he is amused at the opinion—shockingly heterodox as it must appear—that architects would do better by thinking more, and reading such books as Mill's "Essay on Liberty," than follow as sheep this or that leader of fashion.

The editorial note appended to "J. P. S.'s" article relieves me from saying more, though I would add to its very suggestive remark the further opinion, that the study of such works as Comte's "System of Philosophy," Mill's "Logic," and his work on "Liberty," and Herbert Spencer's valuable works on the "Philosophy of Education," would do more in developing invention and original art among students than all the art of ancient or Mediæval times, or all the sketches, drawings, and designs, of our professional quasi-leaders.

G. H. G.

ON PROFESSIONAL PRACTICE.

At the request of the Committee of the Architectural Association, Mr. T. Roger Smith has undertaken to deliver a course of six lectures on professional practice before the members of that body. Two of the lectures have already been given, and have been very fully attended. The first lecture of the course was delivered on Friday, the 15th inst., and the second on Monday evening last. Space will not allow us to give more than brief abstracts of each.

Lecture I.

In commencing, the lecturer defined a knowledge of professional practice to be a knowledge of the mode in which the business of an architect in practice was carried on. He briefly sketched the characteristics of the different types of pupils and assistants, and their general apathy on the subject of professional practice, it being generally thought by those who were training for the profession that a knowledge of professional practice would "come easily enough" when the time arrived for them to commence to practice. But he contended that students could not afford to remain indifferent to this subject if they wished to succeed in life. Again, to those who had newly commenced practice, or who were on the eve of doing so, it was doubly worth while taking this subject into serious consideration, for their position was not free from danger even if full of hope and promise, and a moderate amount of attention to the abstract subject and to the details of it would forewarn them of some risks, and show them how to meet them. Inexperience could only be pleaded to a certain extent by a young architect if anything went wrong, and then it would be a great misfortune to employ such a plea. The thing which would promote a young man's success as an architect, or as anything else, would be for things *not* to go wrong in his hands. To urge such a plea would generally have the effect of causing the employer to say: "More fool I to employ an inexperienced adviser. I will try an old hand next time." It largely depended on an architect's fitness to conduct a practice whether his means would be comfortable or restricted—of their being ample there was, unfortunately, next to no hope. This fitness would not altogether come of itself. It was true that a training in the office of an architect in practice afforded the best opportunity of preparing for responsible practice, but it was one thing to enjoy good opportunities, and quite another thing to make good use of them. It was quite possible, for want of looking far enough ahead, for a man to miss a great many opportunities which were open to him, but which were literally allowed to slip away unused—perhaps unknown. In short, because students were hoping to carry on the business of architects, they were bound to learn how that business was carried on; and as they intended to use the skill and knowledge which they were acquiring, they ought to know in what ways it could be used. Having thus shown that professional practice was the goal of the young architectural student's hopes, it was worth inquiring what, after all, would it turn out to be? What was a man an architect in order to do? What need was there of architects? The answers to these questions were not so simple that they could be given off hand. It should be remembered that there were crafts as important as that of building with no distinct profession established to design for them and superintend their work. For example, nothing was so important to Great Britain as her ships and her machinery; yet these two prime elements in her greatness had not given rise to professions totally disconnected with the trade-part of the business, and for taking the supervision of the work. Our railways, our buildings, and generally our structural works, on the other hand, were under the direction of distinct professions, and it was not very easy to give an absolute reason why the two cases differed. Why, when one wanted a ship or a steam-engine the maker of it was also the designer, while, if it were a mansion or a system of water-works the designer was a distinct person, was not at first sight quite obvious, and the lecturer was inclined to think that but for the accidental course of events, it might have been otherwise. It might seem heresy to say so, but he really believed that there was nothing in the nature of things to make architects indispensable to mankind, or in the nature of ordinary buildings to make it impossible for a man to go to his builder and order a building as he would order a coat, and be supplied with what he wanted, supposing his wants not to be higher than those of the larger bulk of persons engaged in business; in fact, a very large proportion of the buildings actually erected had not been either designed or superintended by architects, and yet they did not tumble down. Now, everything which tended to prove to persons who laid out their money in building that they did so more advantageously by employing an architect would serve to extend the scope of architectural practice; everything which tended to produce an opposite impression, whether correctly or not, either by fostering the notion that an architect could be done without, or that he rendered the erection of buildings expensive or troublesome, would tend to diminish the amount of work that architects received. The conduct of each individual member of the profession would do much towards extending or diminishing the estimation in which architects were held; and whatever the architect might do for the profession, he would make or mar his own practice as he left clients who employed him satisfied or dissatisfied with the results. Architects existed because there was need of taste, skill, and experience in the designing and superintending a building. In broader language, an architect, like every professional man, did something for his client which the client could not do for himself. In the case of a building three different things had to be done. It had to be designed, it had to be constructed, and the business connected with and arising out of its construction had to be transacted. The architect ought, therefore, to be a man of art, a man of skill, and a man of business. These three qualifications were of course unequally mixed in men. A model architect was at least as rare as a phœnix, but if either art, skill, or business tact were totally foreign to a man's training or nature, he would not be able to discharge his duties as an architect. The art qualification was the most obvious one, but taking it for granted that all architects about to commence practice felt the necessity of being able to draw the plan and elevations of a building and put it in perspective, thus giving definite shape to the first shadowy idea of it, this capacity was only the threshold of the art of design. If they could not do more than make telling sketches and pleasing perspectives, their career as architects would not be very brilliant or very extended. The design of a building began with the first sketch, but did not end till the last detail had been drawn out and tried in its permanent place. They must have a knowledge of mouldings, of the actual size to give to features, and a score of such things, before they could be said to be prepared for carrying out a large building. Here it was that many men of talent, perhaps even of genius, broke down, and instead of becoming good architects, settled into commonplace mediocrities; they not only were ignorant, when they took a building in hand, of the requirements of proportion and detail necessary to its success, but they did not make any effort to redeem that ignorance by zealous study even at the eleventh hour. The building, meantime, went up, its details weak or (more probably) coarse, its proportions faulty; and yet when it was finished it looked like a "big" building, and people praised it. The architect did not stop to inquire what the people really knew of that which they spoke so pleasingly about, and unless, by great good fortune, some critic fell foul of it, and the architect took his criticisms to heart and strove to mend, he was a ruined man, so far as his chances of becoming a good artist went. There was a large amount of contrivance as well as decorative treatment wanted in a building; this was an essential part of the *art* of architecture, which was nothing if it were not a whole. One could not separate the plan of a building from the building itself, and say that the one only wanted *skill* and the other *art*. To plan so that the building should be an artistic, well-proportioned whole, was quite as much part of the art of the architect as to decorate a façade; but while on the one hand he joined on to the plan the work of an artist, on the other hand he should grasp an infinity of small practical details, some of them belonging to everyday life, others to building, and others to certain special callings or occupations. No architect was fairly equipped for the practice of his profession unless he was tolerably familiar with at least the majority of these details. The proper provision could not be made for half the things which had to be arranged in a design, unless a number of such details were carried in the memory. In a house, for example, he wondered how many young architects could tell offhand the width and height of a small door, a good sized door, and a large door; the treads and risers of an easy staircase, and those of a steep one; the size of a billiard table, a grand piano, a four-post bedstead, a full-sized bath, and a kitchen range; or the height most suitable from the floor to the glass of a window, and to the ceiling of a bedroom; the space a horse required in a stable, a carriage in a coach-house, &c., and the best shape to give to that space. These things were among the *minutiæ* which pupils systematically neglected, although the information was lying about under their noses. Again, a certain and a large amount of structural knowledge was included in the training of an artistic architect. His buildings were works of constructive art. If they would not stand—nay, if they were not manifestly stable to the eye—they failed in the first requisite of the art; and it was the fact that the building was a structure and not a mere design which raised architecture so immeasurably above scene-painting. The student should learn as much as he could from the works which he saw going on during his pupilage, and should study well the adaptation of particular buildings for special purposes. Many a pupil had worked upon the plans of an important and peculiar structure, and had watched it from beginning to end, and remained quite unaware of the most important principles upon which it was designed. In regard to the next quality required in a competent architect—viz., skill in construction—Mr. Smith urged that inexperience must be counterbalanced by taking great pains. The question of responsibility was so seldom pushed to its extreme legal limits, and an architect so often incurred risks on this head that he escaped from, that few were quite aware how heavy the liabilities were, and fewer still had had to encounter a case of their being enforced in a hostile manner. Architects not only needed the skill to construct, but they required to be watchful that their plans were carried out. In regard to all that belonged to common construction, as well as to difficult structures, they should prepare themselves for practice by knowing the elements of structural science thoroughly, and should learn in what books they could put their hands on all the details. During the process of writing out the specification and making working plans, they should check their work carefully, and leave no risk unthought of. A good knowledge of materials and workmanship was necessary, so that the architect should be able to reject all bad materials, and to condemn any work which was not fairly up to the mark. Although a knowledge of all these things was so essential to an architect entering upon practice, it was constantly the case that capital opportunities of picking it up, with the additional advantage of a clever clerk of the works or a good foreman (who would feel flattered by being asked to trot out his knowledge of building), were neglected. Those who neglected such opportunities of getting practical knowledge would come to regret their want of information some day. The architect was not, perhaps, supposed to know the building materials of every part of England, but he should be familiar with such materials in general, and know the good from the bad. In short, the preparation for the practical side of professional practice was by no means complete unless a man knew some materials and some modes of construction thoroughly, and was prepared on emergency rapidly and accurately to form a judgment upon all. The third qualification he had named was that an architect should be a good man of business, and it was not quite a simple matter to be that. The leading business qualification of a good professional man was that he should be honest, secondly that he should be systematic, and, thirdly, that he should be courteous; unless he possessed these qualifications, and added to them some amount of tact as well, he would hardly be able to practice with credit and comfort. With regard to the first requirement, honesty, there was a certain amount of recognised dishonesty in the profession. The first point to deal with under this head was estimates. A practitioner ought to feel extremely dissatisfied with himself if any large discrepancy was often found between his estimates and builders' tenders. As to that detestable practice of lying in detail, which was known as "leading a client on," no words could be too strong to express the discredit which it cast upon the profession. A business man should be honest in telling unpleasant truths. If he found that a client could not have what he wanted, as was often the case, he should say so, and he should, in short, feel that as his professional position was nothing if he were not trusted, it was his bounden duty to prove himself trustworthy. System was essential to business success. The various matters of routine and of ordinary procedure in the conduct of a building, and all the forms usually employed, should be familiar to the practitioner. In general matters it was especially necessary to follow good precedents. There were many points in general clauses, in the wording of specifications, and in other formal documents, which had a legal value that was not quite understood by beginners. Safety in such cases was always consulted by following good examples while framing such documents. Courtesy and tact, too, were never undervalued by the observant, and were, besides, highly essential to a business man. No man was really a good man of business if he was either a bear or a blunderer. Courtesy, however, was not incompatible with plenty of firmness and a certain amount of high temper. The position which the architect held in relation to the contractor had, in Mr. Smith's opinion, been over-stated by some persons who had considered the subject, and who considered an architect to be, in effect, an umpire. The architect ought, of course, to keep himself entirely independent of the contractor, but he was not justified (in the lecturer's opinion) in considering that the contractor had no claim upon him. Legally, his superintendence, or at least the superintendence of an architect, formed a condition of the contract, and the contractor had a perfect right to assume that the undertaking would be directed by a professional man who understood all about it, and who would act fairly in any dispute. It was just as much a protection to the contractor that there should be an architect as it was to the employer, and in cases where the employer was exacting or unfair the architect was sometimes obliged to resist his wishes pretty stoutly in order to secure fair play for the builder. The miscellaneous business which arose out of a building and which fell on an architect was very varied and almost always considerable, but it did not generally tax his powers beyond what any intelligent, well-educated, courteous, honest and exact man ought to be equal to. In cases requiring very special knowledge it was customary to call in experts. In reference to competitions Mr. Smith said that there was this great attraction about a competition—that it was a good school, while success in it opened the door for a young man to employment of much greater value than he would obtain otherwise; and to any man it frequently offered benefits in the shape of new connection, and of work such as, but for the competition, could not have been secured. The effort also was valuable in training men to think out the special requirements of a special building. Whether these advantages were worth the price they paid for them was another and a very doubtful question. Mr. Smith concluded a very long lecture (of which the foregoing is but a brief abstract) by contending that the architect who possessed the qualifications he had enumerated was by no means an ideal character.

Lecture II.

Mr. **Roger Smith** delivered his second lecture on Monday evening last. He commenced by defining the relations which should subsist between architect and client, and the way in which business should be conducted between the parties. Clients were secured in various ways—sometimes by virtue of some public appointment (such as that of district surveyor), sometimes by the recommendation of a solicitor or friend, and sometimes by success in a competition. Solicitors were generally the best source of introductions to clients. Competitions, although very risky, often brought a good client, and it was well known that the most successful architect of the day had made his practice by competitions. But various opportunities for catching clients presented themselves to every architect commencing to practice, and these opportunities should be eagerly looked for. He deprecated, however, anything like "touting" for clients—the client ought rather to seek out the architect than the architect the client. He held that the first interview with a client should always take place at the architect's own office, and he made it an invariable rule to get the client to come to his office to see the drawings. It was a most important thing, at an early stage of the acquaintanceship, for the architect to get some notion as to the character and tastes of his client, and as to what sort of connections he had. This knowledge would be of great avail, and, if properly used, would avoid a great deal of unpleasantness. In dealing with a client of intelligence (such as manufacturers generally were), who wanted a building erected for his own special business, it would be wise for the architect to defer to the views of his client as to the requirements of the building, if it was evident that the client had thought out the matter for himself and knew what he wanted, especially when there were but trifling differences of detail between the ideas of the client and those of the architect. Architects received their instructions in very different shapes from different clients. Sometimes drawings to scale and models were brought, and at others merely a sheet of paper stating the client's requirements in the building. All architects entering practice should, therefore, be prepared to take up their instructions in the shape in which they came to hand. The first thing to do was to find out definitely what the client wanted and what he was disposed to spend. The two things generally most antagonistic were the client's notions of cost and his ideas of accommodation, and there was always a great difficulty in adjusting the proposed expenditure with the accommodation asked for. The wise thing for the architect, therefore, was to "have it out" early; and he (Mr. Smith) advised them to waste some trouble, and even a few sketches and a few interviews, to have this settled. Generally, it would be found that a client asked for a great deal more than he really wanted. Anything once decided upon, the architect should take every precaution (without appearing to the client to do so) against any misunderstanding or *disagrément* in the future, in the interests of the builder as well as for his own comfort and security. The most important precaution was, as far as possible, to "have things in writing." When a client came and gave any verbal instructions, they should be taken down in writing before his eyes, and then he should be asked to sign them—which no reasonable man would refuse to do; on the contrary, he would be pleased with the precision of the architect. In case of any important interview with a client, it was a custom which he (the lecturer) had adopted to, after the interview, write out in the form of a letter to the client the substance of what was agreed upon at the interview, and to ask for correction if any were needed. The client's reply left no doubt about the matter, and, in addition, the correspondence recorded the history of the business relations between architect and client. On receiving instructions from a client the architect should at once proceed to work out the rudiments of his design while the details were fresh in his memory. It was not a very wise thing, as a rule, to give many or any alternative designs. The architect might make as many as he pleased, but he should not submit them to his client, for, as a rule, he was a better judge of the merits of a design, and of what was required in the building, than was the client. If the architect had any doubt in his own mind as to which of two or three sets of designs he had made was the best, he should consult his most critical and intelligent professional friend as to which design he should submit to his client, and abide by his friend's decision. By an architect submitting alternative designs, and not showing a decided preference for any particular one, the client was apt to think that his architect's judgment was not fixed, and that his advice was not worth having. An architect should be perfectly candid with his client, and should at the outset inform him of any risk, delay, or discomfort likely to ensue on the commencement of building operations. For instance, if the proposed building threatened to obstruct any "ancient lights," and there was any probability that the client, through building, would be liable to an injunction in Chancery, the client should be at once informed of this contingency; and if he thought that it would be possible for him to live in comfort in one part of a house while the other half was being rebuilt he should be undeceived. In the same way the architect should duly inform his clent of all the usual steps of procedure in building, such as the obtaining of "quantities" and the responsibility of getting tenders. If the architect foresaw a likelihood of there being a series of "extras," he should tell the client so in time. There were various sorts of clients. One was the man who thought he understood a great deal about building—perhaps because he was connected with a building society (laughter), or because he had been on one or two building committees, or because he had house property of his own. To have a client of that kind was a great misfortune. Very often he laboured under the delusion that he could build cheaply and well by using up all sorts of old material which he "picked up cheap." In such a case the architect must reckon upon a great deal of extra trouble, anxiety, and delay, and should take care to keep himself free from all responsibility, as this client was apt to interfere very much with the progress of the works. Another type of client was the one who liked to suppose that he was going to build. He would have lots of designs made, and then thought he would wait. Five years elapsed, and he had fresh designs prepared, and then, for some reason or other, the thing went to sleep again. He did not know that architects could do more, in dealing with such clients, than to stipulate for such remuneration as would repay them for the time spent on designing buildings which were not to be carried out, or than to withdraw from the connection as soon as they honourably could, especially if they knew that such a client had served other architects in the same way. Such a client, however, was often fond of showing his architect's designs for what he was "about to build," and indirectly some good was often got out of him in the shape of introductions to his friends who really did build. The best sort of client an architect could possibly have was a thorough business man, possessed of a fair amount of taste, thoroughly able to make up his mind, and determined to stick to his decision, and who had funds sufficient to carry out any undertaking which he gave his architect to do. Such men were by no means rare, and they were well worth working for. Sometimes the client was a committee; this was advantageous in one respect for the architect—disadvantageous in another. A committee could be very troublesome and do very nasty things with impunity, almost, for it had no conscience; but there was this advantage about working for a committee—that when anything was once settled it really *was* settled, and if the architect could get a resolution passed he might be almost sure that he would be allowed to go on uninterruptedly. When the architect had a committee for his client, he was generally left a great deal more to himself. The most important rule in dealing with a committee was to insist upon receiving orders from only one person. In working for Government, one principal point was to adhere to official forms of doing business. When once building operations were commenced, the client should be impressed that he should give no orders or instructions to the builder except through the architect, and that he should pay no money to the builder except on the architect's certificate. The architect should never grant a certificate until it had been fairly earned by the builder. If a client wanted any little fads or whims of his own carried out, the architect should take care to clear himself from responsibility; if he knew they would be failures he should say so outright; and if he was uncertain how they would turn out he should dissuade his client from carrying them out. All unpleasant truths should be told to the client. For instance, if he wanted to occupy a house immediately it was built, he should be told that unsightly stains and blotches on the wall-papers could not be avoided. Coming to the relations of architects to builders, Mr. Smith briefly referred to the North of England custom of employing separate tradesmen to do the different varieties of work necessary in the erection of a building. He believed that a great deal of very good work was produced by this means, but it must certainly entail a great deal more trouble and anxiety on the architect than the London practice of entrusting a building to one general contractor; but whatever was the custom in any locality in which he had to put up a building, it was best for the architect to conform to that custom, and if he was unacquainted with it, he should get some one to give him a few hints upon it. It was best, if possible, to treat with a single respectable builder, known to the architect as a man who could be relied upon, and to advise the client to accept his tender, or otherwise. In the long run, clients did not get more moderate prices in competition. By dealing with a single known respectable builder it would put him on his *amour propre*—his pride of work—and he would not fail to turn out a good job. Many old builders would give the architect a priced schedule of the work to be done in the building they tendered for; this, though not to be taken by the architect as correct with regard to the quantities, would be found useful as a guide for prices in case of "extras" and "omissions." If the builder was to be obtained in competition, it should first be decided whether it should be an "open" or a "limited" competition. Generally, and for works of no special importance, a "limited" competition would suffice, provided that the architect got a good list of names. The list should include the names of none but honest men, and three or four of them should be anxious for the work; this would ensure a fair price being tendered. It was advisable not to invite tenders for the same job from builders of very different standing. In case the client happened to be a committee, any member of which wished to nominate a builder from whom to invite tenders, the committee should be distinctly given to understand that the committeeman who named a builder was responsible for knowing whether, if his nominee was the successful competitor, the job would be safe in that particular builder's hands. In inviting tenders it was better not to mention to any of the competitors the names of the firms they were competing against, because sometimes improper combinations were the result. During the progress of the works a vigilant eye should be kept on the materials and workmanship, and the slightest fault or defect should be complained of and objected to, especially if the builder was a new man. No defect should be allowed to pass unnoticed, however small; but the architect should not be petulant in the way in which he found fault. If he saw a "shaky" piece of timber inserted he should point it out to the builder, saying something to this effect, "Really, Mr. So-and-So, I should have expected a better piece of timber from you." The builder would perhaps reply, "Well, it is not very good, and must have got in by mistake." The architect might perhaps respond, "I have no doubt it did, but you will be good enough to take it out and put in a better piece?" "Oh, certainly, Sir," would be the reply. Thus the architect would have accomplished his object, and acquired a character for sharp-sightedness which would go far towards preventing a recurrence of such faults, while the builder would not be wounded in spirit. Some builders had reputations for "shaky" timbering, and others for bad work of various kinds. The plumbing was often a very weak point in some builders' works. If any of the builders known to have such failings obtained a contract, the architect should keep a sharp look out upon their work, especially that for which they were in ill-repute. One of the worst sort of builders to have to do with was the man who was unaccustomed to work under an architect; he did not like superintendence, and was very fond of going to the client with his grievances against the architect. Again, the man who was not used to doing good work and was unable to do it was a very bad sort of builder. Sometimes, however, a good foreman would go far to compensate for even a bad builder. The best class of builder for moderate works he (Mr. Smith) had found to be the builder who had raised himself from the bench, and had become a master in rather a small way. Anything not beyond the amount of capital he could command would be well entrusted to such a man, who took a pride in his work, and was very moderate in his price. His intimate knowledge of workmen and work ensured a good job being turned out quickly and well. Next to such men as these, it was most advantageous to deal with the large building firms of London—the Trollopes, the Hollands, and the Cubitts. Such firms as these had first-class workmen, first-class materials, and capital superintendence, and their work was admirably carried out. In dealing with such firms it was necessary to be exceedingly careful in matters of account, for they had also first-class accountants, who looked well to their masters' interests, and duly noted down every "extra." In conclusion, Mr. Smith dwelt on the importance of having a good foreman; and as to the clerk of works, unless he was a thoroughly competent one, he was better dispensed with altogether.

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ON CONCRETE BUILDING.*

The Application of Concrete to Fireproof Construction.

By James H. Owen, M.A., Pres., R.I.A.I.

Materials.—½ measure of Portland cement; ½ measure of air-slacked lime, sifted through a fine sieve, mixed together dry. Seven measures of sand and gravel, if possible, of all degrees of fineness, from peas to large eggs, or stones broken to pass through a 2in. ring—the finer should just fill the intervals of the coarser materials. Then all to be mixed together dry and measured. The mixture of cement and lime to be then added, and mixed dry, and the whole tempered with as little water as possible; any more than will just moisten the whole is in excess. The most convenient mode of mixing is to prepare a sufficiently large mortar-board, say 5ft. by 10ft.; at one end form a shallow box, with three fixed sides, the fourth side next the middle of the board moveable. The sides to be as many inches deep as the concrete is to contain measures of material—if 1 to 7, it should be 8in. deep. At 7in. from the bottom fix a lath all round the three fixed sides. In using, the ready-mixed sand and shingle should be thrown into the box up to the level of the lath gauge, the surface should be levelled and struck with a straight-edge resting on the top of the gauge, the cement and lime should then be added, and the surface struck also. It is plain that by this means the materials and measures in the exact proportions directed to be used are attained. The moveable side should then be withdrawn (this side can be fixed in its place when required like the tail board of a cart), and the whole mass well mixed together. The best tool for this purpose is a long-handled rake like a four-pronged fork, with the prongs bent down about 4in. When the mixing is complete, water should be added gradually, not thrown on in quantity, while the heap is still being turned, until the whole is sufficiently moistened, when it should be at once carried away to the work. Where practicable, it is desirable that the mixing should take place under cover.

It must be constantly borne in mind that by rightly using concrete we ought to get, as the result of the operation, a continuous slab, without joints, and of equable strength in every direction, and not admitting of any motion except as the result of fracture of the mass. In all ordinary brick or stone building the several parts are joined together by material of inferior strength, and the parts are capable of motion whenever a local strain is applied the pressure resulting from which exceeds the resisting power of the mortar. This should not be the case in concrete building. With concrete, the whole wall from end to end, and from top to bottom, should form one continuous slab of artificial stone; and to attain this, not merely must each course be continuous in itself (for obvious reasons the work must be carried up in courses), but it must be attached to—cemented firmly to—the courses above and below it; and to effect this it is only necessary to leave rough surfaces, and to take care not to add any fresh concrete to a dry surface or edge. If any previously laid stuff has dried, either in the same or in a lower course, moisten it, not to excess, before adding fresh concrete. For this purpose an ordinary garden watering-pot, with a fine rose, will be the most convenient tool.

It is plain from what has been stated that a foundation of concrete may be of much less bulk than one of masonry or brickwork. I am inclined to think that the accompanying sections would be found quite sufficient for all ordinary soils. These dimensions seem very small; but considering that a four-ton railway engine, travelling at forty or fifty miles an hour, and therefore acting with an impact infinitely exceeding the dead weight of the wall of any ordinary house, is borne by a sleeper 9in. wide, resting on about 9in. of ballast, there seems every reason to believe that such a footing as is shown on the sketches would be ample. To take another illustration—a man of average weight, say thirteen stone, is able, with Indian snow-shoes on, which each would be under two superficial feet in area, to stand on and walk over the surface of snow without sinking to any extent. The weight of a concrete wall 30ft. high and 12in. thick would be nearly three times the weight of the man, but the solidity or power of resistance to pressure of any ordinary soil in foundations is infinitely greater than that of snow. In wet or marshy ground I would recommend that the breadth of the footing at top should be increased by one-fourth, one-third, or one-half, even up to doubling it, forming the sides to the same batter of one to four, but without going deeper, unless it be found, on making trial, that a reasonably good foundation can be got at a moderate depth, in which case an ordinary footing should be laid on the firm stratum, and the wall commenced at its finished thickness so much lower down.

The most embarrassing site of all to build on is when one portion is soft and others hard and solid. The best plan is not to build on such a site at all; but if it must be done, I would recommend to reduce the footing on the hard ground down to having hardly any, or even no offset at all, and largely increasing the breadth of footing over the soft parts, so as to approximate as nearly as possible to an equal subsidence over the whole area. No rule or measure can be laid down as to the extent to which this should be done; we can only get a rough idea of the variation in quality from the different penetrations of a bar driven with about the same force into both sorts of soil; but where such differences exist, I think it would not be a bad plan to dig, in the soft places, a trench below the level of the intended concrete footing, and of about 2ft. greater width, and fill it in with gravel without lime or cement, and level it to form a bed for the concrete footing. The additional resisting power would be nearly if not quite equal to that of the same amount of concrete.

It may not be amiss to give here an extract from Viollet le Duc,* describing the foundations of the great Cathedral at Amiens, which he had an opportunity of examining down to the very bottom. He describes them as consisting "of a layer of brick earth 16in. thick placed over the virgin clay; next is a bed of concrete 16in. thick; next fourteen courses of from 12in. to 16in. in thickness each, of rough blocks of a sort of chalk, full of flint and very hard, which comes out in large masses; above this are one course of coursing stone and then courses of freestone under the surface." . . . "Behind the facing of the foundations is a filling of large pieces of flint, of hard chalk, and 'Croissy' stone, grouted ('noyé') with a very hard and well-made mortar. On this artificial rock rests this immense cathedral. At Nôtre Dame, in Paris, the foundations are also made with extreme care, faced with strong quarry blocks of great thickness, the whole resting on a good soil, that is, on the lower sand of the Seine, which is coarse and of a greenish colour. As for the piling which is generally believed to be under the masonry of most of our great cathedrals, we have never found a trace of it." And in a note he adds: "It is the same with this supposed piling under Nôtre Dame de Paris and Nôtre Dame d'Amiens, as with so many other myths current for ages as to the construction of Gothic buildings; *It would not be possible to construct a great cathedral on piles.* These buildings can be founded only on broad footings; the masses to be borne varying considerably in elevation, *the primary condition of stability required a foundation perfectly homogeneous, and capable of continuous resistance under the surface.*" Without endorsing all that is said as regards piling, in this respect M. Viollet le Duc seems to be led away by the enthusiasm inspired by his subject. You have in the last sentence an exact description of a perfect foundation, and such as *you can only be sure of getting* by using concrete.

We will turn next to what in ordinary specifications would be comprised under the heads of "Mason, Stonecutter, Bricklayer, and Pavior," and, in substituting cement for each and all of these, we must bear in mind the nature of the material proposed to be used, and the qualities belonging to it which distinguish it from the materials in ordinary use. The only operations it undergoes are mixing the materials and casting them in a mould; for, however it is applied in detail, or whatever we call the machinery employed, it comes practically to this, that it is cast in a mould (though the moulds differ in some respects from those in ordinary use for other materials), and when so cast the whole mass is homogeneous, without joints, of great cohesive strength, and impervious to moisture. We shall never rightly appreciate concrete and the mode of using it unless we put out of our heads that it is a mixture of cement and gravel, and all associations with ordinary combinations of lime and brick or stone. We shall best realise the work to be done if we fix in our minds the idea of cast iron. Just imagine a sort of iron which can be moulded cold, in a leisurely manner, and which is only about one-twelfth as strong as common iron, and you have then the right sort of ideas with which to begin working in concrete. There is only one other element to bear in mind, but it is too important not to mention it separately, and it is this—that every other material used in building, except the hard granites and most compact limestones, depreciate with time and exposure, and require an initial excess of material to be used, and all sorts of surface applications, constantly renewed, to preserve them, whereas Portland cement concrete is permanent and durable under all circumstances, and increases rapidly and enormously in strength, and continues to increase—but in a continually diminishing ratio—for as long as observations have up to the present time been made upon it. This is a most important quality, as it enables us to use it with great economy of material, and with the certainty that if it bears the weight imposed on it at first, it will continue not merely to bear it, but will become continually more able to bear it as time elapses.

The first portion of the "mason's" work to be settled is, of course, the walls. For an ordinary two-story house, with walls not exceeding 24ft. high, 9in. is quite sufficient thickness. For walls above that height I would recommend that the thickness should be increased by about 3in. for every 6ft. added to the height—of course taking advantage of the occurrence of the floors to reduce the thickness, as shown by construction of an ordinary three-story house. As concrete hardly arrives at its initial strength in less than a month from the time of mixing, it is evident that it is very unsafe to fill up the walls to a great height with too great rapidity. I believe that it will be the safest course to build at the rate of only about 3ft. of height per week, and then let the work rest and consolidate for a week; this would give a rate of building of 6ft. per month, which at first sight may appear to be slow progress, but, considering the great rapidity with which the internal finishing of a concrete house can be carried on, the total time occupied in building would not exceed what would be required with ordinary materials. In building the walls, as in the foundations, care must be taken to moisten the surface of old work before adding fresh concrete; and this, as before stated, is best done by watering through a very fine rose. As a concrete wall is intensely hard, its surface will be subject to damp from condensation. In inferior houses this may probably be met sufficiently by covering the inside surface with very rough mortar plaster, and washing it with two or three coats of thick lime-wash; but for houses of a better class the walls may either be battened or built hollow. If battening be decided on, provision must be made for fixing the battens, as will be described hereafter. If the walls are to be built hollow, the simplest course to adopt is to lay on the footings a series of brick on edges, tailing into the spaces to be filled by the inner and outer concrete walls, and set about 3ft. apart, and on these to lay a piece of plank in the direction of the length of the wall, tapered on its cross section and notched to pass down an inch or two in the bricks, which it will keep in their places during the operation; the concrete is then filled in and well rammed up to the level of this plank core, after which it is removed and another course of bricks is laid, breaking joint with the previous course, and the operation is repeated. As regards the thickness of these walls: the inner wall should not be less than 4½in. thick, nor the outer one than 8in., and of course the concrete must be carried the full thickness of the wall round all openings.

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* Read before the Architectural Association of Ireland, on Thursday, Nov. 14, 1872, the President J. J. O'CALLAGHAN in the chair.

* "Dictionnaire de l'Architecture," IV. pp. 175-7.—Art. Construction.

I purposely refrain from attempting any description of the various forms of moulds or machinery for forming concrete walls; each practitioner has his own invention—most of them patented—but one and all answering the old description, "The one is as good as the other, and a great deal better too," if we may judge from the puffing advertisements that meet one on all sides in the professional prints; but if it be desired to act without having recourse to any of these patentees, I would recommend the following course to be adopted:—Provide a sufficient number of stakes of squared timber, say 4in. by 4in. about 3ft. long, tapered and sharpened at one end; having excavated the trenches ready for putting in the concrete for the footings, before doing so mark out by lines the thickness of the walls plus twice the thickness of the planking necessary to form the wall-moulds, and drive the prepared stakes into the ground hard enough to keep upright during the filling of the trenches, and at such places, at angles, and along the length as will be convenient for the future uprights to support the planking.

If necessary, the width of the footings may be increased where the stakes occur, in order to surround them with the concrete. When the stakes are withdrawn after the footings are set there will be a set of sockets provided, into which posts of the same scantling may be set; these can be easily plumbed, and tied together on top by ropes or bands of iron or strips of timber. Then it is only necessary to slide in planks, and the mould for the wall is complete. To keep the planks apart, cross pieces of the required length can be jammed between them and removed after the intervals between them have been packed with concrete. Such an apparatus can be prepared anywhere, and worked by any one who can use a plumb-rule.

We next come to the formation of the openings. If a mere hole in the wall is intended, a core, solid or hollow, will be inserted of the proper size and at the proper level; and, in building with concrete, every hole must be foreseen and provided for beforehand, whether it be for drains, air, water, or gas-piping, or tubing for bells: after-boring must be avoided as far as possible. For openings intended to be filled in with windows, doors, or grates, frames or moulds must be made of the shape and size of the interior of the opening; these need not be of the whole height, as they can be raised from time to time until the proper height is attained, and in this way one mould would suffice for several openings of different heights, so long as the width and form of head were the same: thus, if the windows are segment-headed, and the same width in all the stories, but varying in height—say 7ft., 6ft., and 3ft. 6in.—if the mould be made to fit the upper 2ft. of one it can be used for all; and in the same way with doors—no lintels will be required in building with concrete, because it forms its own lintels, and requires no arch over it. And here let me call your attention to an ancient example of a concrete lintel given by Viollet le Duc in the *Dictionnaire de l'Architecture*, article "Béton." p. 206, Vol. II.:—"We see in the castle of the city of Carcassone windows and doors of the end of the eleventh century, the lintels of which, of considerable bearing, are formed of concrete run in a mould. We give a sketch of one of these windows: the lintel *a* is of concrete of extreme hardness, and we have not seen one of them broken by the loading, which, however, is considerable." He adds in a foot-note :—"The shaft which divides this window into two parts is of white marble from the Pyrenees, as also are the base and capital; the jambs and second lintel *b* are of green sandstone. The constructors thereby have admitted that a piece of concrete was less fragile than the natural stones, when supported only at its ends, and loaded in the middle. This lintel is only 9·84in. thick, with a bearing of 3ft. 7¼in., and a breadth of about 11·8in." You will perceive that the floor girders rest immediately on it without any intervening wallplates. This example is of great importance as giving confidence in the right use of the material.

All frames must be made without joggles, because it is evident that if the horns or joggles are left on they must be bedded in the work as it proceeds, and any after repair would be very difficult.

For fireplaces and chimneys, the breasts should be constructed in the same manner as the ordinary walls. A simple mould of three planks will enable the opening to be formed up to the arch; this and the gathering should be formed in one mould of sheet iron or zinc on a timber frame somewhat similar to those very admirable articles made of terra-cotta, and queerly named "oncomes" by the Scotch manufacturers. A timber drum about 2ft. long, with a handle for drawing it up, will serve as core to the flues, which cannot by this means of building be left foul or gathered too quickly. Almost any amount of corbelling can be done most easily and economically with concrete, and fireplaces can be put in positions that would be considered impossible in ordinary building; flues can be left for ventilation also with great ease. The only precaution which I would recommend is not to carry ventilation flues up to the top of a chimney-shaft, but to give them outlet just over the roof at the bottom of the shaft, so as to avoid return smoke, the nuisance of which is a very dear price to pay for ventilation. Outside the roof preparation should be made for fixing the flashings by bedding thin laths of deal in the course they are intended to take, which, when withdrawn, will leave a groove into which the lead can be pinned. All offsets and the top of the shafts must be left rough and afterwards moistened and finished with fine cement mortar, well trowelled and sloped to throw off the wet. I would recommend also to bed on top of each flue a length of flue-lining, projecting about 4in.—it will assist the draught and save the arrises round the flue from wear and tear.

No wall-plates, tassels, bond-timber, or any such thing must be bedded in concrete walls. The plates for the roof will be bedded on the walls, and all those for carrying floors on corbel courses of concrete, which can be easily formed by attaching a mould of the shape and size required to the face of the wall at the proper height, and can be afterwards covered with plaster so as to form a cornice to the room. For hearths, the joists should be trimmed to the size required. A strong fillet of deal should be fixed against the inside face of the joists, with rough boarding thereon sufficient to bear the weight of the concrete until it sets. The box thus formed should then be filled in with concrete extending to the back of the fireplace; and by finishing the surface with fine stuff, well trowelled on the face, you will have trimmer-arch, hearth, and back hearth all in one solid block, and perfect security against fire. This operation had better not be done until the floors are laid. From what has been stated, there will be no difficulty in constructing any portion of a building which may not have been described, bearing in mind that any width of opening can be spanned without lintel or iron arch-bar, and that all idea of spreading may be left out of the calculation of the jambs; it is only necessary to give them mass enough to sustain the load pressing vertically upon them. There is no lateral pressure, provided the mould is kept up until the concrete has consolidated. In all building operations over-haste is the evil of the day, and this is specially dangerous in concrete building.

It may be convenient now, before passing to what is usually cut-stone work, to describe the nature of the materials. For the sake of economy, I have recommended a mixture of air-slacked lime with the cement in the foundations, but in the shaft walls cement only should be used. It should weigh not less than 112lb. to the imperial bushel; if much lighter than this, it cannot be depended on, and should be rejected. It will be safest, I think, to adhere, for the body of the work, to the same proportions as given for the concrete in the foundations—1 to 7—but finer stuff should be used for some purposes: thus for forming the quoins, the angles of jambs and arches, a mixture of 1 to 3 or 4 should be used, rejecting the coarser materials. This fine stuff will take a sharp arris from the mould, and retain it, and save a good deal of time in the after-finishing. All corbelling and wherever great strength is required should be done with even finer stuff, say 1 to 2, as the strength of the mass decreases very rapidly with the increase of the quantity of sand or gravel, and for this reason I would not recommend the common practice of inserting in the heart of a concrete wall lumps of stone; it should never be done where strength and coherence are of importance.

Now as regards the cut-stone work. Suppose that a hall is to have a floor not boarded, and steps that would be stone ordinarily, the proper course will be to fill to within 3in. of the finished level with any dry rubbish, level the surface, fill in with concrete and float it over to the required level, and finish the surface with fine stuff, placed in a thin coat over the moistened surface of the coarse concrete, and continually trowelled until it is quite smooth and hard. The steps must be formed one by one, by fixing a board of the required height where the face of the riser will come, filling with fine stuff against the face of the board, and hearting with coarse stuff; the upper surface would be finished with the floor. If a flight of steps is required, they may be constructed with perfect safety, attached to the wall only on one side, if required, and of any projection, varying the thickness of material in proportion to the work to be done. The steps should be formed simultaneously with the walls, but of the finer material, say 1 to 2; the mould would be constructed of a soffit of timber planking, securely fixed, as it will have great weight to bear, a timber string at the end of the intended projection, and a moveable board of the size of the face of the riser. This moveable board will be fixed in its place for each step in succession, from the bottom to the top, each in turn being the foundation of, and incorporated with, its successor, so that the final result is not so much a set of individual steps, but one continuous mass with steps notched out of it. There is no difficulty, except in the case of winders, where the moulds of the soffits will be some expense and trouble, but of course infinitely less than carving out each separate stone. The soffit mould in this case may either be made of very thin boards bent to the shape, or a rough stage can be erected and a solid core formed by building with half mortared rubble up to the shape, and smoothing over with mortar. By this means great accuracy can be attained, and a surface of paper spread over the plaster will prevent its adhering to the concrete, although it would be no great matter if it did, as the soft mortar could be very easily removed.

As regards window sills, it may be asked, Why have them at all? But as this may be considered an unsatisfactory mode of getting rid of the subject, it may be as well to provide for them. In building the walls, the bottom of the opening left for the window should correspond with the bottom of the sill; and in proceeding to form the sill, a board should be fixed so as to form the rim of the inside face, and a mould should be made in the form of a box with a bottom and one side and two ends; on the bottom a fillet should be fixed to form the throating. The box, when fixed in its place, would be filled, and the upper surface formed by drawing a mould formed to the shape along its length just as an ordinary cornice. All cornices, eave, string, and barge courses would be treated in a similar manner; but it should be matter of consideration whether the finishing of all continuous moulded faces would not be executed more cheaply if run in the ordinary way than by casting in a continuous mould.

In building the walls, projecting corbel courses have been left all round them. On them the tassels will be laid, and the joists on the tassels. On the upper surface of the joists I would suggest that a fillet should be fixed of the same thickness as the floor, and that then a skirting of cement should be run round each floor. My reason for this is, that it obviates the necessity for inserting plugs for fixing timber sheeting. The inner face of the walls may be either skimmed over with lime-putty or white-washed; the outer face coated with a very thin coat of fine cement, or tinted with a cement-wash; the ceilings and floors would be treated in the ordinary way.

As regards the mode of roofing, there is no necessity for any variation from the ordinary mode; but if it is desired to have a very cheap form of roof, I would recommend the following, the description of which I extract from a treatise on Portland Cement by A. Lipowitz:—

1. The inclination of the framework of the roof (which must have an even surface) should be at the rate of one-half or three-quarters of an inch per foot. The rafters or joists should not be more than 2ft. 3in. apart, so as to give sufficient strength. Boards of 1in. or 1¼in. are fastened on the rafters, and should be rebated. These are then covered with a layer of sand ¼in. or ½in. thick, to produce an even surface.

2. Strong brown paper, in continuous rolls, and as broad as possible, is then laid upon it, so that each length overlaps the other by about 4in. When the whole or a large part has thus been covered with paper, the mixture is put into a cauldron, in the proportion of 100lb. of tar to 180lb. of Portland cement. Care must be taken to heat the tar gently, and to mix the cement with it gradually, in order to prevent its boiling over. This mixture of tar and cement must then be laid as hot as possible on the paper with a tar brush. The next layer of paper is then laid on it, and smoothed with a light wooden roller. In this way the whole roof must be covered. In order to break the joints of the paper, begin the second layer with half the breadth, and proceed as before. The third and fourth layers are in like manner laid with alternate layers of the mixed cement and tar and brown paper. The last layer must be carefully covered with cement, and then strewed with sifted ashes to the thickness of ¼in. Next to the gutter is a board, covered with

zinc, and projecting about 2in. It should be laid on after the second layer has been completed, so as to be covered by the third and fourth. If there are any chimneys projecting through the roof, they should be surrounded with zinc immediately after the first layer has been finished, and before the gravel is strewed upon it. This zinc should rise 6in. up the sides of the chimneys, and 3in. upon the roof; the upper edges should be bent, so as to be let into the joints of the brickwork, where they should be carefully fixed with cement.

3. The whole is then finished with a coating of sifted gravel, containing about one-third of dry loam, truly levelled with rakes and scrapers. This work should not be attempted in rainy or frosty weather.

The workmen should wear very light boots, or, better still, none at all, and should always stand on thin boards when working at the roof.

The advantages of this system of roofing are:—

1.—A smaller quantity of wood is used.

2.—The roof, being flat, gives more room in the upper floors of the house.

3.—It is more convenient for constructing garrets.

4.—Protection from external fire, and affords easy access to firemen.

5.—If properly constructed, these roofs never require repair.

Several roofs at Herschberg, in the Reisengebirge, constructed on this principle, are now twenty-two years old, and have never been repaired.

A square foot of this roofing, without the roofing and including the labour, costs about 1⅓d., and Mr. C. Purkart, in Töplitz, guarantees roofs made under his superintendence.

I have tried this mode of roofing myself, and have every reason to be satisfied with it. It is, of course, much cheaper than the ordinary roof.

The imaginary house is now floored and roofed, but it still remains to fit it with doors, windows, grates, and chimney-pieces, shelving, rails for hanging up clothes, and the innumerable host of things comprehended under the title of fittings. All these must be carefully borne in mind, and provided for beforehand. The walls are like cast iron; they do not admit of the rough and ready driving in of plugs wherever a carpenter fancies—for preference into a flue, if it is at all possible to do so. These walls can only be pierced with great difficulty; the place of all those things must be fixed beforehand, and, while the walls are in building, swallow-tailed plugs of dry wood must be built in for the purpose of fixing them; and that there may be no mistake, every bit of carpenters' and joiners' work should be delivered on the ground before the walls have got many feet high; and if the plugs are placed in the right position, there will be no difficulty in fixing any of the joiners' work, except the door and window frames. These, I think, can only be properly secured by confining them in their places by jamb-linings and architraves which are themselves securely fixed to the plugs.

I think there remains nothing more to add as regards the use of concrete in ordinary houses; one built as I have been describing would be cheap, durable, quieter than one built of brick or stone, safer as regards fire, and free from rats and mice and other vermin. I propose to continue this paper by a consideration of the subject of fireproof building in general, and the special advantages attending the use of concrete, and the modifications of the ordinary mode of using concrete, and the materials of which it is composed, which should be adopted in fireproof buildings.

Mr. Carson, in proposing a vote of thanks to Mr. Owen, said that, in his opinion, concrete would never supersede brick, unless, owing to the increasing scarcity of labour, a difficulty might arise in obtaining skilled labour.

Mr. Drew, in seconding the vote of thanks, said that concrete forced itself on us as a material for building, and should be met as such. He said selenitic mortar was preferable to cement concrete, and cheaper. He approved of concrete for a lower class of buildings, such as barns, workmen's houses, &c., but not for the better class of architecture. Although it was claimed for concrete that skilled labour was wholly unnecessary, yet a skilled workman was necessary in order to prepare the moulds and fix the different portions of the work, and that the preparation of the moulds would make it more expensive than masonry.

Mr. Briggs bore witness to the great benefit that accrues from using concrete in foundations.

Mr. Henderson said that he was at present carrying out a building in concrete. He had one skilled carpenter and six labourers, who execute on an average one course of 20in. each day. The method adopted was by side boards, secured in their places by iron bolts and nuts, the boards being moved upwards, course by course, as the work proceeds. Floors are carried on partitions 6in. thick, stone corbels checked for tassels are inserted so as to distribute the weight evenly; window and door frames have the joggles left on them, and are set in their place as the work proceeds, and are therefore perfectly immoveable. A stream runs convenient to the site, from which coarse and fine shingle is obtained of the relative proportions 5 to 2, which are mixed with 1-7th part of cement. The walls are also packed with stones. He considered that there would be a difficulty in running mouldings, as it would not be easy to fix guides to the mouldings, as nails cannot be driven into the walls. He considered that hollow walls would be better formed by square drums 3in. apart than by the method described by Mr. Owen. He calculated the cost to be as 75 to 100 between concrete and masonry.

The President, in putting the vote of thanks, said that he had carefully calculated the odds on both sides, and had decided in favour of a good rubble wall, and to avoid concrete as much as possible. As to studding, he deprecated it completely, being nothing more than a makeshift. He had seen an 18in. wall in the dampest climate resist the moisture. In foundations the use of concrete is invaluable. He approved very much of the method of having corbel courses to support floors, as no wood should be built in the walls. That after all that had been said in favour of concrete, he thought that the walls bore a small proportion to the whole cost of the building; strike a balance and you will find that brick and mortar will hold its own. How could a cathedral be built in concrete? How would a flying buttress and pinnacles be executed? Concrete destroys colour, the very life of a building. He thought, however, that it might be moulded in blocks, and coloured, and be used as a substitute for stone.

Mr. Owen, in replying, said he would only recommend concrete for the very humblest class of buildings, and as a means of solving the problem of housing the poorer classes. It is not at all impossible to use concrete in an artistic manner, or to combine it with other materials. It is, in fact, the only fireproof material. The carriage of cement is the same in all parts of Ireland, and the other materials are to be found everywhere in Ireland. On the whole, he thought for a certain class of work there was no material like concrete.

CONSTRUCTION AND CONDITION OF BAKE-HOUSES IN THE EAST-END OF LONDON.

FROM the last report of the medical officer, Dr. Liddle, we find that inquiries have been made into the condition of the bake-houses of the Whitechapel district. The bake-houses in this district are 74 in number. Of these, 41 are situated under ground. The condition of 27 was found to be very unsatisfactory as regards cleanliness, and 23 as regards light and ventilation. In 12 instances the privies are in the bake-houses, 5 of which were found to be in a filthy condition; only a few of them are properly supplied with water. In 19 instances the water receptacles for the use of the bake-houses were defective as regards their general conditions, some of the butts in use being old and dilapidated, some without either covers or taps, while others were in the bake-houses, adjoining the privies. In 19 instances the brick or stone floor of the bake-houses was defective. The total number of persons employed in the bake-houses was 158, and the number of ovens was 81. The number of bake-houses in which Sunday bakings are carried on is 42. There was no evidence of overcrowding in any of the bake-houses. In no instance was it ascertained that persons were found making a sleeping room of the bake-house; neither were persons under the age of 18 ascertained to be at work longer than the hours prescribed by the Act. In no case, however, was a proper lavatory provided for the men to wash before commencing or leaving work. The men are required to be in the bake-house about 14 hours daily, but they are said not actually to work more than 8 hours.

From the above return there will scarcely be a difference of opinion regarding the desirability of effecting a sanitary reform in the bake-houses. In those bake-houses which are situated underground, where there is a want of daylight, where gas is burned to a great extent, where ample provision is not made for carrying off the products of combustion and the heated air which is combined with the sulphurous acid gas which is given off from the oven fires; and especially where adequate means are not provided for the admission of fresh air, it may reasonably be expected that men remaining in such places for 14 hours daily will suffer in their health. In addition to these evils the men are exposed to the inhalation of the fine particles of flour, which act as a mechanical irritant to the lungs. We need not, therefore, be surprised to find that consumption is a common complaint among the journeymen bakers. Nearly all the men seen at work were pale and unhealthy-looking. "On entering the bake-houses," says Dr. Liddle, "I found in one or two instances such a difficulty of breathing that I could not remain in them longer than a few minutes; and I learned that whenever a window was opened to let in light and air, the men, who are generally in a state of perspiration, cannot bear the cold draught which then poured in upon them; and they find it more comfortable to work in a heated and ill-ventilated place than to expose themselves to the painful effects of draughts of cold air. Habit appears to so reconcile the journeymen bakers to the injurious effects of working in ill-ventilated places as to render them indifferent to them."

CHURCH OF S. JOHN THE BAPTIST, KENSINGTON.

WE have chosen this week for a double page illustration this noble church, now in course of erection from designs furnished by Mr. James Brooks, architect. Our readers are now so familiar with Mr Brooks's bold and characteristic work that it is unnecessary for us to offer any criticism on this design. The church consists of a nave, 73ft. long, 28ft. wide, 76ft. high to the ridge, and 60ft. to the top of its coved ceiling, with lean-to-aisles 13ft. wide. Beyond these is a compartment treated as projecting transepts, with oblong crux between, surmounted by a stately flêche. This portion is, however, as regards the arrangement of the seats, treated internally on plan as a simple continuation of the nave and aisles, but by its expanded width, its lofty arches, &c., forms a grand introduction, as it were, to the chancel, with which, rather than with the nave, it is architecturally incorporated, and to which it adds great dignity, being vaulted in the same manner and at the same level. The chancel consists of two bays, and is terminated by a semicircular apse. On the north side it has an aisle, called a morning chapel, also with a similar though smaller apse; and there is an aisle on the south side extending the two bays square-ended, with a two-storied sacristy beyond.

COMPETITIONS.

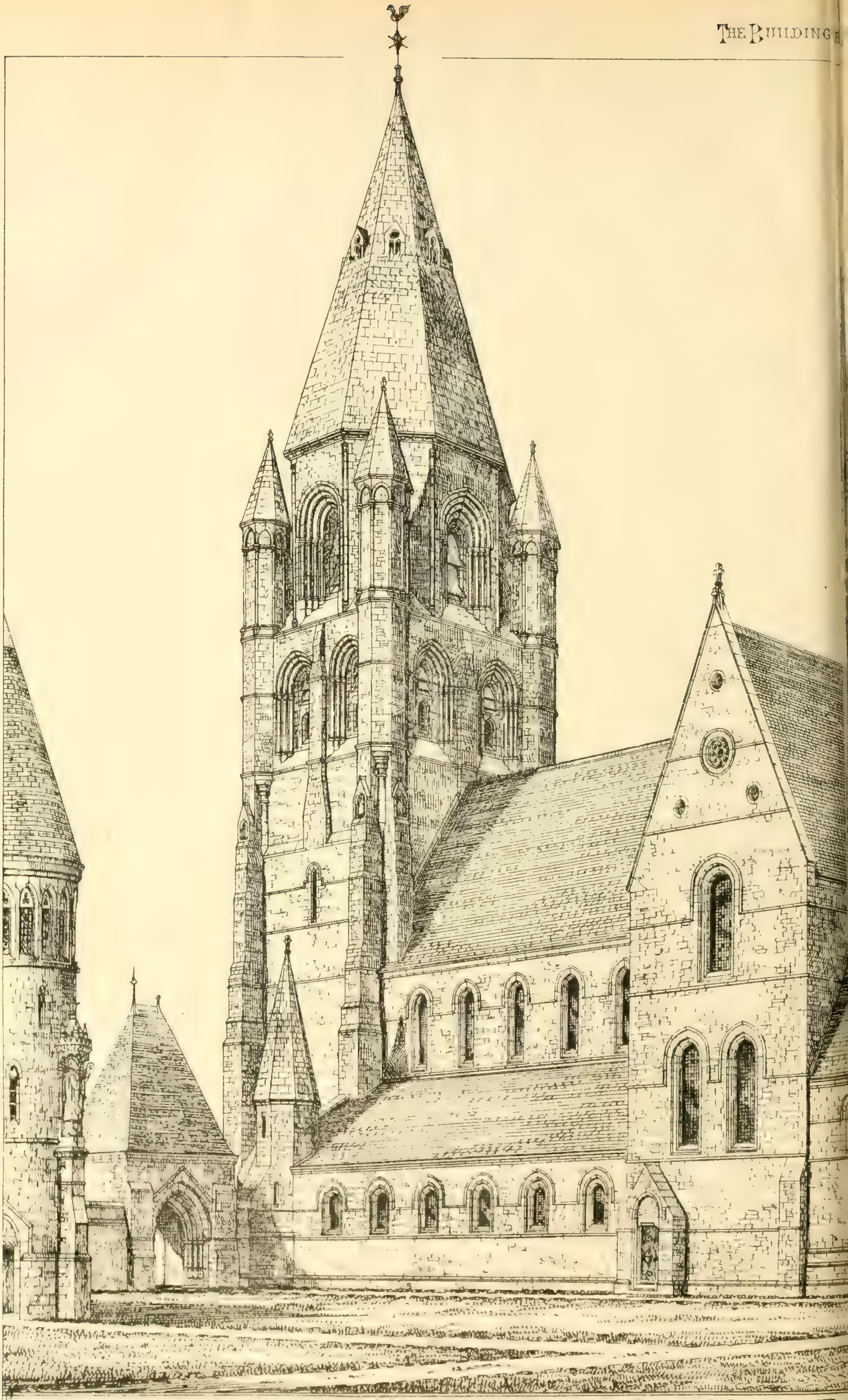
Edinburgh.—Sir George Gilbert Scott's designs have taken the first premium in the Edinburgh Cathedral Competition.

Wraysbury Schools Competition.—The design of Mr. Fred. W. Albury, A.R.I.B.A., of Reading, has been selected by the School Board for the above. Twenty-seven designs were sent in.

Isle of Man.—Messrs. Picton, Sherlock, and Weightman, of Liverpool, who were appointed to report on the various plans for the proposed new street at Douglas, Isle of Man, have made their award. Annexed is the substance of the report:—Four plans were submitted in competition—No. 1 by Mr. Culshaw, No. 2 by Mr. Todhunter, No. 3 by Mr. Robertson, No. 4 by Mr. C. O. Ellison. On the whole they give the preference to the plan of Mr. Culshaw in its main features. In reference to cost, there does not seem to be much difference between the respective schemes, exclusive of Mr. Ellison's, the cost of which appears lower than the others in consequence of terminating at the foreshore. Mr. Culshaw's estimated cost of the property to be obtained is less than that made by the local surveyors, and after inquiry and calculation they are inclined to believe that the latter amount will better approximate to the fact. They are of opinion that the object of the improvement will be secured by carrying a new street through the heart of the town, taking such a margin as will allow of new buildings of a superior class being erected, thus giving an impulse of progress to the localities through which it passes. This they believe will be effected by Mr. Culshaw's plan.

* * *

Builders' Benevolent Institution.—An election of four pensioners on the funds of this Institution (two male and two female) took place yesterday (Thursday) at Willis's Rooms, King-street, S. James's, the President, Edwin Lawrence, Esq. (Lawrence & Sons), in the chair. There were five male and eight female candidates. The poll opened at twelve o'clock noon, and closed at three p.m., when the scrutineers (Messrs. T. Stirling, Matthew Hall, and R. K. Burstall) announced that the successful candidates were:—Males: J. W. Annis and Matthew Saich; Females: Ann Budd and Frances Seare. The chairman, having formally declared the result of the election, votes of thanks to the scrutineers (proposed by Mr. Thorn, and seconded by Mr. Richardson) and to the chairman (on the motion of Mr. Burstall) brought the proceedings to a close.



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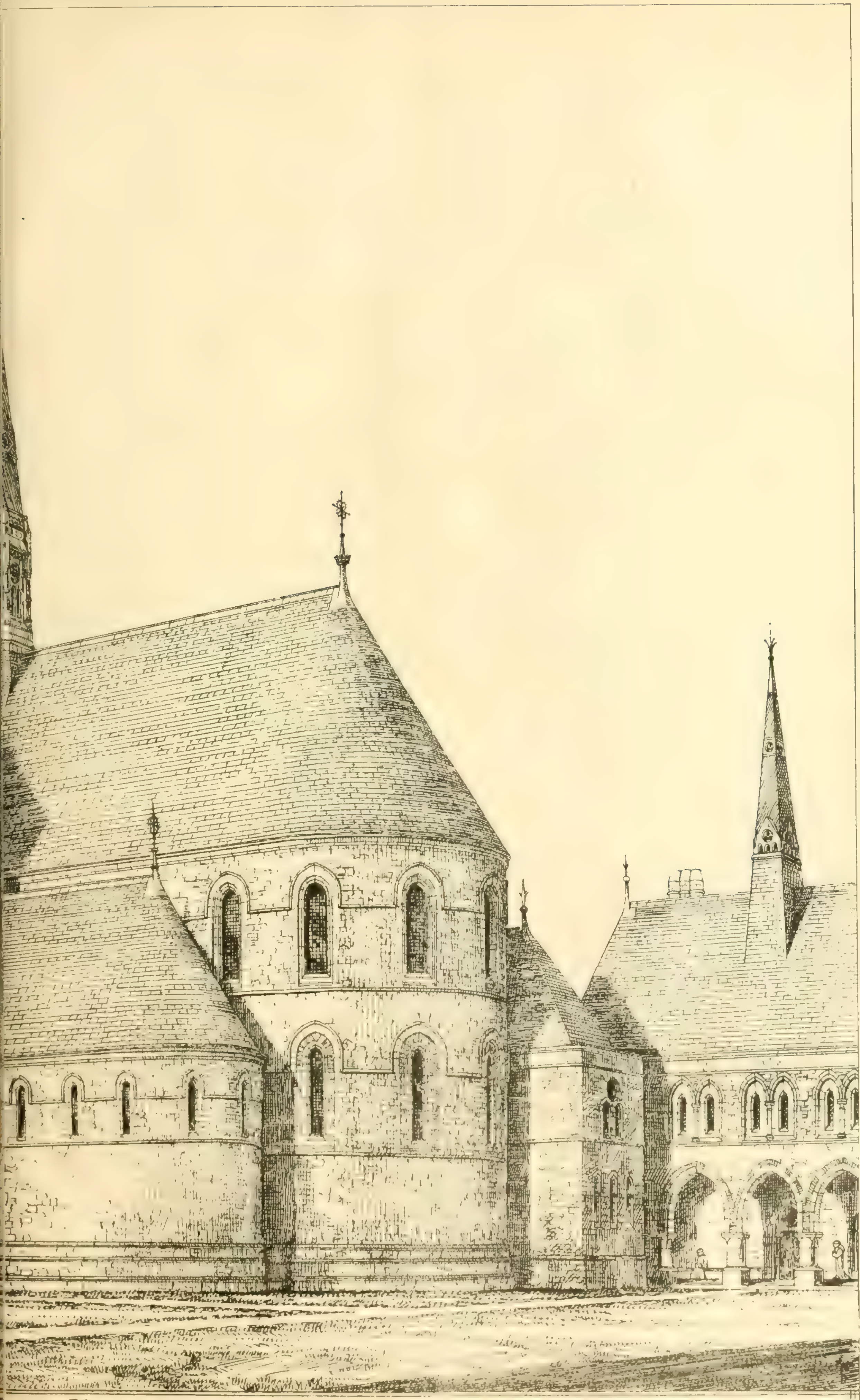

: Kensington : West James Brooks architect.

THE OWNERSHIP OF COAL AND OTHER MINERALS.

At the present time, when so much is being said about coal and coal proprietors, and when blame is cast on the men for striking and proprietors for combining to unfairly raise the price of coal, the following remarks, made by Mr. Arundel Rogers, in a paper read before the last meeting of the Institution of Surveyors, are worth perusing:—

I merely desire, said Mr. Rogers, to consider whether those rights may not be placed on a better footing with equal advantage both to the Crown and the people. As before observed, gold and silver in this country, whether under the Royal domains or private lands, are the absolute property of the Crown; all other minerals in private lands are the absolute property of the subject, and the Crown as well as the subject, so far as respects these separate absolute rights, may or may not authorise the exploring of the soil. In foreign countries the law varies in different States, but generally the State reserves some power over the minerals, with a view of seeing that the lands are explored when it has been ascertained that there is a reasonable prospect of success; whilst, on the other hand, it seeks very frequently to check improvident enterprises.

In France, by virtue of various articles of the Code Napoleon, combined with the laws of 1791 and 1810, it is provided that the mineral wealth of France, below the depth of 100ft., should become the property of the nation, to be disposed of by the Government in the general interest of the public, and unfettered by any claim from the owner of the soil. The Government has a sovereign right to grant a concession to whomsoever it pleases, foreigners as well as citizens, and acknowledges no right of preference in the owner of the soil, or the first discoverer of the minerals; but, nevertheless, a claim upon the consideration and goodwill of the Government. But, although mines cannot be explored, even by the proprietor of the soil, except under a concession from the Government, quarries can be worked by the proprietor of the soil without any such concession, subject to certain regulations and restrictions prescribed by the State.

In Belgium, the French laws of 1791 and 1810, combined with a new code of laws made by Belgium herself in 1837, govern the proprietary rights in mines and quarries. As in France, so in Belgium, mines below a certain depth are the property of the nation, and are worked under Government grants, but quarries are worked by the proprietors of the soil without those restrictions imposed by the French laws. But the Belgian legislators have recently introduced important modifications of the French laws. By the code of 1837 a preference is given to the proprietor of the soil to have the first concession for exploring minerals under his own lands, but by a decree of 1856, the proprietor must satisfy the Government that he possesses the necessary pecuniary funds for exploring the mines and carrying on the undertaking, and that the land can be profitably worked.

In Germany, among the petty states, some considerable modifications of the ancient laws have been made by the different sovereigns. Generally, every one is entitled to a provisional right of search, and upon the discovery of a vein or other mineral deposit, the discoverer is entitled, as of right, to a grant of a certain measured space of ground for the purpose of pursuing his discovery. The demand for the grant cannot be refused unless there be conflicting claims, in which case the first finder and not the first claimant is entitled to preference. The interest in the mine, when granted, is permanent, assignable, and transmissible: but is subject to the obligation of continual working, of payment of the tenth to the State, and a small fixed quarterly rent. The interest in a mine worked under such a grant is divided into shares, of which a small share is assigned to the land owner as a compensation for the easements over his land. In some districts, a mine deserted by the grantee, or left unworked for the space of a year, is declared vacant and again free; the use of timber, fuel and water, and space for necessary buildings, are provided at fixed payments to the landlord; and labourers are exempt from various tolls and duties on articles of necessary consumption, and from military service, and they have, moreover, a lien on the produce for their wages.

In Prussia, so soon as a discovery is reported to the Government, it is inquired into by the local officer, who gives a provisional concession, and after a shaft has been sunk, and the Government surveyor has been able to descend and inspect the mine, and report hat there is reasonable ground for believing in the existence of minerals, and that they can be profitably worked, the Government confirms the provisional grant, which establishes a good title to the mine. But as in France, so in Prussia, no right of preference to the grant can be claimed by the proprietor of the soil.

The mining laws of Austria were revised and amended by an imperial decree of 1854; but they do not present any remarkable features of difference from the laws of Germany in general. Consequently, the sovereign has the power of granting concessions to work minerals in private lands, and reserves for the State a double duty; the one fixed, depending upon the area of the mine, and the other variable, being one-tenth of the raw produce, payable in money.

Several codes of law have from time to time been promulgated in Spain, modifying the ancient laws; and, in 1859, a new code of laws, entitled "Legislaçion de Minas," was passed, by virtue of which the mining laws of that country are consolidated and amended. By those laws, all inorganic, metalliferous, combustible and saline substances, and phosphate of lime, when they occur in veins which require mining operations, and precious stones, whether they are discovered on or beneath the surface, are declared to be the property of the State, and no one has a right to search for them without a grant from the Government; but stone, sand, and other substances required for building or agricultural purposes are exempt from the operation of the above-mentioned laws, and also other minerals found in beds of rivers until they amount to such quantities as to require a mining establishment. When the Government grants a concession, the grantee has to pay the owner of the surface a fair value for so much of the land as he may require, and also to give security for the payment of a fair compensation for any future damage which may ensue to the surface in consequence of the mining operations undertaken or prosecuted under and by virtue of the concession. The concession does not enable the grantee to work for minerals in vineyards, ornamental or pasture grounds, or within forty yards of any building, railway, public road, or canal, without the license of the owner of the surface, or of the governor of the State, nor within fourteen hundred yards of fortified places without a license from the military authorities. Upon the establishment of the independence of the Spanish colonies, the seceding provinces generally retained the laws of the mother State: but they have since made such modifications of them as were necessary on changing a monarchical for a republican and federal form of government, without materially changing the mining laws. In Mexico, the principal alterations consisted in conferring exclusive and absolute jurisdiction on the local mining tribunal of each province, and by admitting foreigners to obtain and hold mining property on the same terms as citizens.

The Royal prerogative in Russia is limited to mines and minerals situate within the domains of the Crown. These domains, unlike other countries, are of vast extent. They include entire provinces, for instance, Asiatic Russia, Siberia, and Kirghisia. But although royal rights are limited to Crown lands, the Government has an absolute control over the sale of all the precious metals, whether found in Crown lands or in the lands of private persons. Those extracted from the Crown lands of Siberia are obliged to be given up to the authorities, to be sold under the direction of the Government, but the produce is paid to the owner of the mine, after deducting the duties and expenses of sale. The aristocracy and landed proprietors of Russia have secured to themselves greater privileges over their lands than have fallen to the lot of owners in other states. Even gold and silver form no exception to their absolute rights. They may explore their own lands themselves, or grant a license to others without the interference of the Government.

It will thus be seen that whilst in Great Britain the Crown claims the absolute right to all the gold and silver in private lands, as well as in its own domains, she makes no claim to any other minerals in private lands, or any right of interference with them. In Russia there is neither any claim to gold or silver, nor any right of interference with private lands; but in nearly all the other countries on the Continent there is either an absolute right to all minerals—in some instances immediately below the surface itself, in others beyond a certain defined depth of a hundred feet—with an absolute right to insist upon granting a license to work the minerals, and in some cases to prevent useless expenditure of money in exploring them. Which state of things is most likely to contribute to the mutual advantage of the State and the proprietors? and would the State be justified in exercising any control or interference with mineral rights in private lands in this country, and, if so, in what manner and to what extent? On the other hand, would the owner of private lands be justified in asking the Crown to relinquish her right to the gold and silver under the lands of the subject?

The two questions are equally important, and claim our serious attention.

The baser metals, now hidden in the lands of private persons, either from want of energy, skill, or capital, may for ever remain there, to the great detriment both of the owner and the people. May not, therefore, the Legislature stimulate the energy, provide the skill, or assist with capital, the owner of these metals? And, on the other hand, the gold and silver in private lands is never worked by the Crown, and may for ever remain undiscovered or unexplored, in consequence of the unwillingness of the owner of the soil to expend his capital, not knowing what demands the Crown may make upon him.

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THE USE OF WATER GLASS IN BUILDING.

On this subject H. Wagner, of Pfiffligheim, remarks, in the *Hesse Trade Circular*, that four kinds of water glass are used—potash water glass, soda water glass, the double water glass (a combination of equal parts of potash and soda with silica), and fixing water glass. For the technical application of double water glass, it is sufficient to mix 3 parts of concentrated potash water glass with 2 parts of concentrated soda water glass. The fixing water glass is a potash water glass completely saturated with silica, to which a portion of soluble soda silicate is added, that is, to 3 parts of concentrated potash water glass, 1 part of soluble soda silicate. The latter is prepared by fusing together 3 parts of pure anhydrous carbonate of soda with 2 parts of powdered quartz, and making a concentrated solution of it. The fixing water glass has the great advantage of producing no efflorescence of carbonate of soda, and the coating is clean and free from spots, on which account it is preferred for ornament and internal decoration. In coating with water glass, it is important to consider the degree of dilution, and the proportions given here should be modified according to circumstances. Whatever be the kind of water glass, that of 33°, diluted with twice its weight of rain or river water, should be used for the first coat, but with equal weight of water for the second and third coat. Water glass of 66° is diluted for the first coat with 5, for the second and third with 2½, parts by weight. These proportions are retained for sandstones and bricks. Upon a surface of 100 square metres, the following proportions are required:

For 1st	coat	4lb.	of water glass of	33°	and	12lb. water.
,, 2nd	,,	4lb.	,,	33°	,,	8lb. ,,
,, 3rd	,,	3lb.	,,	33°	,,	6lb. ,,

To produce a fine and durable coat of water glass upon a wall, special regard must be had to the dressing. The problem is to give it a stonelike solidity, and to fuse it evenly with the wall, taking care, at the same time, that the water glass shall soak uniformly into every part. In order to obtain this, the mortar should be more thin than fat; the water glass would penetrate with difficulty into limy mortar, and cause also cracks, which should be avoided.

This must be well dried and exposed for a longer time to the air, to be converted into a subcarbonate of lime, because otherwise the quicklime would partially decompose the water glass. The wall thus prepared is saturated with soda or double water glass of 33°, using the same process of dilution for each coat as above given. With larger surfaces small rain spouts are used, from which the jet is distributed like fine rain by being forced through a strainer provided for the purpose. This operation may be repeated two or three times, taking care, however, that the pores of the wall are not closed by a too frequent charge, or too concentrated solutions, and thus become unfit to receive the colours.

In order to secure a good uniform ground, a water glass mortar should be prepared in the following manner:—10 parts of sharp dried sand, and 3 parts of quicklime, slaked in the air (by sprinkling fresh burnt lime with water, and frequent stirring till it is reduced to a fine powder), are mixed with 2 parts of chalk, or limestone, powdered quite dry and passed through a moderately fine sieve; then this mixture is worked into a plastic dough with a soda water glass of 33°, diluted with 2 parts of water, so that it can be applied like ordinary mortar for dressing. This mortar does good service, also, in the joints of brick walls, and wherever it is important to guard against air and damp. It will differ from this according as more sand or chalk is added, and in many cases also the water glass solution employed is more concentrated. After drying, which takes a few days, it becomes stone hard, and should be saturated repeatedly in the manner described with a solution of soda water glass (which is cheaper than potash water glass, and for this purpose quite sufficient).

When the foundation is laid in one way or the other, after drying, the coating with colour may be proceeded with. The colours to be applied, before they are brought in contact with the water glass, are moistened with sufficient rain or river water without rendering them liquid. The more plastic and uniform this colour paste is, the better it mixes afterwards with the water glass, and the less fear there is that the colour will curdle.

Even when the different coats are laid on as prescribed, the double water glass should be used. After twenty-four hours a fresh coat may be applied, and to prevent an efflorescence of carbonate of soda, it is advisable to give the last coat with fixing water glass. In order to impart a certain gloss like oil paint, the last coat, when dry, is gone over with a very dilute solution of fixing water glass, taking care that those parts which imbibe slowly present a uniform appearance. The choice of the various colours is by no means indifferent, as many have so close an affinity to water glass that they are no sooner in contact than they curdle at once to a useless mass, as often happens with the commercial oxide of iron, when, after its preparation, it still contains free sulphuric acid. Other colours are materially changed in their tints; for this reason, none of those colours derived from the organic kingdom should be used, as they fade sooner or later.

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MOUNTING DRAWINGS AND TRACINGS.

THE following details of an operation often inquired about will answer many queries. They are extracted from the *Engineer*. The difficulty of mounting a drawing and tracing increases directly as the size, and also depends in a great degree upon the shape of the sheet. Thus a square sheet is more troublesome to mount than one of the same area in which the length is greater than the breadth. As a rule, the majority of engineering drawings and tracings which are mounted do not exceed the size of a sheet of double elephant, or 40in. by 26in. The two objects to be attained in mounting either a drawing or a tracing are, first, that it should adhere uniformly and thoroughly to the material upon which it is mounted, and, secondly, that it should be perfectly smooth without the slightest crease or pucker whatever. Obviously, it is in ensuring the latter requisite that the difficulty, or we should more correctly say the trouble, consists. Unless the drawing or tracing is very small two persons are required to manage the operation, although individual dexterity will sometimes suffice to render one operator sufficient.

Let us suppose that it is required to mount a drawing made on a sheet of double elephant on brown holland. First, have ready a pot of paste, a flat, not a round, paste brush, as the former spreads the paste more uniformly, a small sponge, some small iron tacks, a hammer, some sheets of thin white paper, and a clean duster. The paste should be well made, not too fluid—as the damping of the paper dilutes it a little—and there should be no lumps in it. The tacks should not be the common tin tacks, as they are very blunt at the point and make holes unnecessarily large. Let the brown holland be the same size as the drawing, with about an inch of margin to spare on each of the four sides. Place the board upon which the drawing is to be mounted on a couple of stools, or a table, or in some position in which it can be readily got at all round. Lay the holland upon it, and tack it down to the board along one of the longer sides, with tacks about 3in. apart, driven far enough to hold, but no farther, to avoid disfiguring the board. Having slightly damped the holland, the remaining three sides may be tacked down, taking care to stretch it taut, but not to strain it too much. The drawing should now be laid face downwards on a sheet of perfectly clean white paper, and thoroughly wetted all over with the sponge with clean water, especially the edges. These are the parts of the paper which dry first, and if they are not well wetted, they dry before the rest of the paper, and so check the uniform expansion of the whole, which is indispensable to making a good mount. The holland and drawing should then be well "payed over" with paste, but not too thickly, and the actual operation of mounting may be proceeded with. The two mounters, as they may be termed, seize the drawing each of them by one of the shorter sides, holding a corner with each hand, and hold it extended a short distance above the board to see where it should lie. No. 1 mounter, as we will term him, lays down upon the holland the end he holds, running his fingers along the edge so as to press it down. He then takes a sheet of clean paper, and places it for a length of about 6in. over the drawing, and smooths it down with both his hands, pressing it from the centre towards the sides. No. 2 all this while holds his end of the paper raised above the board, and only allows it to gradually touch the holland as No. 1 advances the sheet of clean paper over the drawing, and continues smoothing it down with his hands. When the whole drawing has been laid down in this manner, the two mounters may with the edge of a set square smooth the drawing all over from the centre towards the edges. The object of this is to press or squeeze out the superfluous paste, as well as every particle of air between the drawing and the holland. All creases and puckers are due to the presence of air underneath the drawing. If a crease, as sometimes happens, particularly in mounting tracings, is very obstinate and "won't come out," the drawing or tracing should be taken up at once and laid down again. Using undue force to get rid of the crease pucker is liable to damage the drawing. When the operation has been successfully accomplished the drawing should be left until it is perfectly dry. A slip of the paper along each side should be cut off with the holland. For this reason the drawing should not be "trimmed" before it is mounted, but the paper laid down with its edges rough and unsquared. If trimmed previously to mounting, it may have to be squared again, as some of the edges may expand a little unequally. Drawings are mounted on brown holland, on union (a mixture of linen and cotton), and on cotton. Of these the strongest is the holland, but it is also thicker than the other materials. When a thin material is required "shrouding" answers very well. Care must be taken to lay down the drawing on the "undressed" side of the "shrouding," or rather that which is less "dressed" than the other. Tracings are always mounted on paper, and sometimes, but not often, the paper with the tracing on it is afterwards mounted on linen or cotton, as the case may be. The operation of mounting a tracing on paper is the same as that already described for a drawing, but more care and more patience is required, in consequence of the flimsier character of the material, and the much greater liability to air bubbles and puckers. It is not an uncommon circumstance for an old hand to be obliged to take up a tracing and lay it down again in order to get it smooth and free from creases. The errors usually committed by beginners in mounting drawings and tracings, are, overstraining the material upon which the drawing is to be mounted, putting on too much paste, too much hurry on the part of No. 2 in laying down his end of the drawing or tracing, and too great an anxiety to cut it off before it is dry. Drying a "mount" by exposing it to a fire should never be attempted, as the consequence will probably be the peeling off of the whole drawing. The heat of the room, and time, and air, and sunshine, are the legitimate means for the purpose. Some discretion must be observed in the use of the set square, or whatever instrument be used for smoothing the surface of the drawing or tracing. This is more especially necessary in the latter case, or the mounter, on inspecting his work, will find to his dismay that he has scraped away a portion of the tracing with the superfluous paste. Besides drawings and tracings, it is sometimes desirable to mount plans belonging to books, and still retain them, or replace them, in their original place in the volume. For this purpose we can recommend the use of silk as the mounting material. It is not only a material upon which a "mount" can be made with great facility, but the result is infinitely more satisfactory than with any description of linen or cotton. While stronger than these, it is very much thinner, which last quality, combined with the former, constitutes the two desiderata in a material for mounting. If drawings are required to be mounted, which have been previously joined together by overlapping, the joints should be "feather edged," or they will be very thick and clumsy when mounted.

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CHIPS.

The foundation stone of the new County and Probate Courts, Peterborough, was laid on Friday week. Messrs. S. & W. Pattinson, of Sleaford, are the builders.

Messrs. Bedford Lemere & Co. have photographed the more important objects in the Royal Architectural Museum, and are now offering sets for sale to architects and others. The series contains some 200 examples, chiefly details from English and French Cathedrals.

The annual distribution of prizes to the students of the Cardiff School of Art took place on Wednesday week, the Bishop of Llandaff presiding.

Messrs. J. & J. Belcher, architects, 3, Adelaide-place, London Bridge, in a letter to us on our article a fortnight since on Queen Victoria street, City, say —"We consider our client, Mr. James Wheeler, the proprietor of Mansion House Buildings, had the honour of commencing the buildings in the new street, his being the first two plots of ground let by the Metropolitan Board of Works."

Building Intelligence.

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CHURCHES AND CHAPELS.

Kendal.—A new Wesleyan Chapel was opened on Wednesday at Kendal. The building will seat 170 persons. The seats are open, with sloping backs, and solid ornamental bench ends. The ceiling is half-timbered. The timber throughout is of pitch-pine and red deal, stained and varnished. The style is modernised English Gothic, the entrance front being faced with dressings of freestone and limestone, broken up to form buttresses and a gable. The total cost of erection, including site and old buildings, will be about £480; and the whole has been carried out from the designs, and under the superintendence, of Mr. Stephen Shaw, architect, of Kendal.

Kingston-on-Thames.—The new church of S. John the Evangelist, Kingston-on-Thames, was consecrated on Thursday week. The church, which is of stone, and Early English in style, consists of nave, aisles, south porch, transepts, and chancel, terminating in an apse. The tower and spire have yet to be built. The architect is Mr. Phelps, of Surbiton. The cost, including lighting and warming, is about £7,000.

Melton-on-the-Hill, near Doncaster.—A new roof has recently been placed over the nave of this church, in lieu of the old plaster ceiling. It consists of principal rafters, with collars and carved braces, moulded and pierced, and is boarded to receive the stone covering. The work has been executed in pitch pine, by Mr. John Presley, under the superintendence of the architect, Mr. E. Isle Hubbard, of Rotherham. The church contains some interesting features, amongst which is a small but beautiful stained glass window of the fifteenth century, containing a figure of William of Melton, Archbishop of York, and a beautiful Virgin and Child.

Tortworth.—The parish church of Tortworth, Gloucestershire, was reopened on Tuesday, after restoration by Messrs. Slater & Carpenter, at a cost of £5,000. The tower has been partially restored; it was pulled down to about 30ft. from the top, and the pinnacles have been restored as they originally were. The body of the church has been entirely rebuilt. The walls are of sandstone and Box freestone. In the interior of the building, the rafters are of Memel timber, and the boards of pitch pine. The roof is a double one, each part being of a circular shape, with carved bosses, and about 30ft. high. An addition has been made to the edifice by the erection of a vestry on the north side.

Warwick.—On S. Edmund's Day the Bishop of Worcester consecrated the new north aisle that has been added to the Church of All Saints, Warwick, and which, with other additions, has cost £2,000. The roof of the nave has been elevated several feet, and eight clerestory windows added on each side, and the chancel elongated 16ft. Mr. D. Smith, of Chilvers Coton, was the builder.

SCHOOLS.

London.—At the meeting of the London School Board, on Wednesday, Mr. Charles Reed, M.P., brought up a report from the Works Committee. He moved:—"That the tender of Messrs. Downs & Co., amounting to £9,328, for the erection of a school providing accommodation for 1,213 children, on the site in New Winchester-street, Islington, be accepted. That the tender of Messrs. L. H. & R. Roberts, amounting to £8,371, for the erection of a school providing accommodation for 1038 children, on the site in Gloucester-street, Stepney, be accepted. That the tender of Messrs. Cooke & Green, of Marlborough-street, Blackfriars-road, amounting to £5,758, for the erection of a school, providing accommodation for 788 children, on the site in Creek-road, Deptford, be accepted. That the quantity surveyor's commission, amounting to £153, for taking out the quantities in the case of the Gloucester-street, Stepney, Schools, be paid direct by the Board." The resolution was agreed to. The following resolution, by Mr. Chatfeild Clarke, was lost on a division by 12 to 7:—That it be an instruction to the Works Committee to include in the terms of contracts with the builders of any schools for the Board a power to require sureties, which sureties shall be demanded unless there are exceptional circumstances rendering such a course unnecessary."

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In our notice of the Slow Combustion Grate, last week, we incorrectly stated that Messrs. Clark & Hunt were the inventors of the grate. This is not the case, they being the agents for the patentees.

A new Free Church is about to be erected at Ferry-hill, Aberdeen, at a cost of £2,500, from designs by Mr. M'Millan, architect.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

The time for sending in the drawings for the Building News School Planning Competition is extended to the 30th of November, 1872. For particulars, see Building News, August 9, 1872, p. 102, and Answers to Correspondents, September 6, 1872.

Received.—P. J. W.—T. A. R.—G. E. & Co.—G. W.—J. D. —G. F. D.—H. & Co.—S. & Co.—S. Bros.—E. W. T.—J. C. M. A. B.—E. T. S.—W. & T.—J. N.—E. F. B.—P. M.—J. F.

One in Doubt.—Pray remain there.

School Planning Competition.—Several drawings have come to hand. Full particulars next week.

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Correspondence.

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GRANITE BUILDINGS.

To the Editor of the Building News.

Sir,—I am quite sure that if Mr. Travis, who wrote to you last week so lengthily in advocacy of the use of granite in buildings, could see, or will even read of, the complete collapse and destruction of all the granite buildings in the fire at Boston, he would tell a different tale. For his information I copy from a letter just received. The writer says: "Of these granite buildings it may be said, with almost literal exactness, that there is not one stone left upon another that is not torn down, and not only so but the massive stones thus disjointed are disintegrated. I picked up and pocketed a piece of marble and a piece of granite of equal size which lay alongside each other. They had been subjected to the same tremendous test. The granite crumbled under my fingers like caked rice, the marble was as firm as when it was quarried. All over this tract you may see what must amount to two millions of bushels of grains of granite the size of blasting powder, reduced to that state not by concussion, mark you—for granite splits and does not disintegrate, however hard—but by mere heat. It looks as if there had been a hailstorm of adamant." Let Mr. Travis forsake granite and try marble with a good brick backing.—I am, &c., E. G.

ARE ARCHITECTS BORN OR MADE?

Sir,—Mr. T. Roger Smith, in his very excellent lecture, declared that "architects are made, not born." The assertion can be true only in a limited sense, for when we remember that there are architects *and* architects, it must be admitted that some are born and some are made. Nothing, says the lecturer, can supply the want of genius; but, surely, genius is more a birth or creation than a thing to be manufactured. Architecture does not stand alone in this definition. Handel, Mozart, Reynolds, Angelo, Phidias, Wakeham, Steinbach, Wren, Newton, Shakespeare, Scott, Dickens, were they made or born? It is, doubtless, true that knowledge, skill, precedent, and examples have helped to build those men up, but by their genius—their birthright inheritance—were they enabled to soar so high above the level of mankind. We have not only within reach the examples and acquired knowledge which those geniuses had, but, much more, the works of their own hands and a wider range of research, so that if architects are made, surely they ought to rise immeasurcably above their present position, and even to excel the noblest ancient examples. That the skill of imitation and reproduction has taken the place of originality, invention, and, in fact, the essential elements of genius, is partly because the age is only too fruitful in architects who are made, and beggarly indeed in architects who are born. Many men enter the profession, but, finding architecture ungenial to their nature, the vastest and most complete education in the world can never make them architects. It is the same with every other profession of art and science. Give me that man who has left some other calling and taken to architecture, not from necessity, but from love and predilection, and he will shine in it much more than the carefully-nurtured pupil or the man of deep erudition absorbed in the triumphs of the past. The paragraph of the lecture in which the assertion we have been discussing occurs is dismissed with tantalising brevity, but I think I cannot do better than answer Mr. Smith out of that excellent book of his, "The Acoustics of Public Buildings," at p. 2:—

"One word, however, must be said upon the degree of dependence to be placed upon theoretical knowledge. Let it ever be borne in mind that in all branches of architectural practice rules and principles never did, never will, and never can supersede the necessity for intelligence, judgment, tact, experience, and something of intuitive perception in their application. The most successful architects will tell you that their judgment of the probable acoustic [and architectural] effect of this or that arrangement is as much, or more, the result of a sort of instinct —a kind of internal perception of what will do or what will not do, as it is of the application of a code of laws, or a set of rules; and knowledge, to be of much value in this department, must be associated with a sort of tact, not to say instinct, which is not to be gained at once or easily, nor without making the subject one of constant observation and thought when visiting existing buildings, or when preparing or examining designs for new ones."

I make no apology for quoting the paragraph at length, for such is its depth of truth and warning that it deserves to be indelibly impressed upon the mind of every student.—I am, &c., H.

CHIMNEYS AND FLUES.

Sir,—Mr. J. P. Seddon, in his letter last week, asks:—"Will not the vast stacks he ("H.") admires conduct starwards most of the heat of a fire less than would suffice to roast an ox?" To answer that question from practical observation would necessitate a starring expedition, combined with a knowledge of the art of cookery, so that, for the present, I fear the question must remain one of those lofty and soaring unsolved problems of the day. It may, however, be confessed that the principle of all flues is to conduct heat out of the rooms rather than into them. Far more practical and commonplace is the reference to the flues in Belgravia, 9in. by 9in., which answer; and those 14in. by 9in., which do not answer, and Mr. Seddon asks me to explain why it should be so. My answer is that, although I know nothing of the stacks referred to, they are not carried sufficiently high into the air. There are a thousand things which may possibly detract from the perfect working of a flue, and many of them may be altogether unobserved. Thus the pitch of the roof, affecting the rebound of the wind, the presence of a lofty tree, the propinquity of a cross street, of high or low buildings, and even the quality of the materials with which the flue is built, as well as its size, may, in a measure, affect the draught in some winds. It is probable, moreover, that a large flue should be carried higher than a small one, hence large factory flues are invariably carried an enormous height. Neither is it clear that, supposing the positions of of the large and small flues in Belgravia were exchanged, that those which answer now would not, and *vice versâ.* But a large flue carried well into the lighter air is less likely to be affected by changes of temperature or wind than a small one which, just peeping out of the roof, may answer generally.

Loftiness will not only prevent the accumulation of damp in the flue, but obviate the equality of the density or pressure of air on the top and bottom, so that a current is always ensured. The rebound of the wind, the lowness of the stack, the pitch of the roof, and other objects, may cause a downward draught in some winds, and greater height in the stack would cure this; indeed, I invariably find that great height is a safe answer, and a sure cure. I do not think that so much depends upon the size of the flue as its height, smoothness, uniformity, and straightness, all of which should be strictly enjoined, so that the air pass freely upward.

The object of the large flue and still larger throat is that in any spasmodic fluctuation on the top a greater bulk of air would have to be displaced, and, as it were, driven back before such change would be felt in the room. This is a principle more fully explained in that excellent book, by Mr. T. R. Smith, "The Acoustics of Public Buildings," referred to in another letter. The further object of the big throat is to imprison, as it were, a great quantity of heated air, whose natural tendency is upward, and thus, by creating a vacuum to increase the draught, which, in its turn, would be regulated by the valve of the register. This throat, however, is not absolutely necessary for the perfect working of every flue.

As I have to endeavoured to answer Mr. Seddon's two questions to the best of my ability, allow me, in conclusion, on the *tu quoque* principle, to put two to him. First, why do not old large tall stacks require artificial aids? Second, why is it that all modern small flues and low stacks require pot or cowl?—I am, &c. H.

Sir,—Mr. Seddon's letter, in your issue of the 22nd inst., is, in my opinion, both right and wrong. He is right in his statement that contracting a house flue at the bottom, and opening it wider at the top, is almost invariably a panacea against smoky chimneys, but I hold him to be wrong that flues with wide throats and contracted outlets are necessarily uneconomical. True, our forefathers and the monks of old used this system, and had fuel *ad libitum* at their disposal, and could keep large fires going, without considering the expense of fuel. True also, that we now build our factory chimneys with wider outlets at the top, and contracted inlets at the bottom. But our reason for departing from the rule of our forefathers in this latter respect is to promote more rapid combustion of fuel than they required, for manufacturers of old rarely, if ever, exceeded 25lb. pressure of steam per square inch, whereas engineers are all now advocating three and four times that pressure in the boilers, and I know of instances of factories now being advantageously worked with boiler pressure up to 150lb. per square inch. This being the tendency of the age, we are obliged to leave our forefathers' example, and reverse the order of things, putting up chimneys of much larger area than was their wont, and reversing their plan by making them as much wider at the top than at the bottom as possible. But all this, bear in mind, is to increase the draught, *ergo*, the rapidity of combustion of fuel, and so raise steam to higher pressure. I do not suppose our ancestors submitted to smoky fireplaces any more than we are inclined to do, and still we see no instances of their departing from their practice of wide throats at the bottom. Their building art was not so far advanced as ours, their window frames were not so tightly fitted; the same as to the doors; their ceilings were seldom underdrawn, and, consequently, their rooms contained numerous opportunities in the way of niches and crevices wherein air could rush to supply the requirements of the chimney draughts. If we would obviate smoky chimneys, it must not be in the throats of the chimneys, but we must find a means of bringing air into the rooms in some convenient place, say, under the hearthstone, whence air can be drawn up the chimney, and if the terminal rises reasonably higher than the roofs in its immediate vicinity, a room so provided need never be complained of as being smoky. As to economy in consumption, this can be insured most certainly by building chimneys (as did our ancestors) wide throated. But let us follow the good old days in another matter—viz., make our fires "upon the hearth." They had no real and sham registers, no patent this, that, or the other, but simply piled their fuel on a heap and lighted it. If Messrs. Doulton would make a firebrick trough, the bottom 3in. or 4in. thick, the sides 1½in. to 2in. thick, and not more than 3in. high, place that in a neatly tiled recess, and place fire therein, we should have no rapid consumption of fuel; and if air is admitted into the vicinity of the fireplace, nay, even into the flue above the fire, we should have no smoky chimneys, and no extravagant grates. No patent is required, for we are only following what has already been done by many of your readers when extemporising a fire for boiling a kettle at a picnic: gipsies seldom use grates in their "fireplaces;" so it is perfectly feasible to get a fire to burn without admitting air underneath, and even a housemaid will learn in time to do it successfully. I conceive the firebrick trough may be made much more architectural than any register grate or dogstove, the front may be fluted or panelled, or embossed, the more the better, as all excrescences serve to throw off the heat better than plane surfaces.

I fear I have occupied too much of your space, so will quickly wind up by saying that in my opinion Mr. Seddon has not drawn the correct line between smoky chimneys and slow combustion or economy. —I am, &c. C. E.

"CARLISLE LIBERALITY."

Sir,—The uncalled for, although partly expected, answer to my letter which appeared in your issue of the 15th inst., obliges me again to trespass upon your valuable space.

In the first place, Mr. Vynne says, in his letter last week, that "their (the Hall Company's) capital is limited." Are we to infer from this that the capitals of the architects who may compete should be unlimited? For the very reason that he thinks it would be judicious to give no premiums, I thought it judicious that the profession should withhold from competing, because our capitals *may* also be limited.

Secondly, he says, "The architect who sends in the best plan will have the preference, and as there is no premium the amount thereof will not have to be deducted from his commission, as is usually the case, of which little arrangement Mr. Ord is doubtless aware." Respecting the preference being given to the architect who may send the best plans, it is questionable whether the committee, "not having much experience in these matters," may be able to select the best without calling in a professional man, qualified and unprejudiced, to assist them in their decision. No mention of this, however, is made in the instructions; therefore little hope can be entertained from that quarter.

Again, thirdly, Mr. Vynne goes on to say "that it did not occur to the committee that it was necessary to advertise that, having selected an architect, they would treat him in a straightforward manner, and that they did not intend to insult him." Evidently Mr. Vynne cannot be a professional man, or he would understand that you cannot, in a case of this kind, insult a man by telling him at once what your intention is, and what you really mean to do, instead of leaving it for him to surmise that your intentions are honourable and straightforward. He must understand as he has made this an unlimited competition, the probability there is that the majority of the competitors know nothing of him further than seeing his name figure as hon. sec. to a company, of which they know even less.

With regard to architects' estimates being so often below the builder's tender, is not singular at all, and may be answered in very few words, and faithfully illustrated by the case in question. A company, with a limited capital, invites architects to send in competition drawings for a building with almost unlimited accommodation; competitors are, therefore, unduly tempted to keep their estimates of cost as low as possible, and, consequently, often even under the average.

I now trust I have fully and satisfactorily explained to Mr. Vynne the motives which prompted me to ventilate this matter; should he, however, require any further information on the subject I would beg to refer him to the Hon. Sec. of the Competition Committee, Royal Institute of British Architects, or to No. 910 of the Building News, where he will find a code of rules or regulations for the conduct of architectural competitions, which I trust may have a beneficial and enlightening influence. In conclusion, I may only add, with reference to my "characteristic blundering" in making a muddle of Mr. Vynne's name, I would refer him to your printer, or his own handwriting, as I sent you the original lithographic impression of instructions as forwarded to me.—I am, &c.,

Durham, November 25. George Ord.

GREEK AND GOTHIC.

Sir,—I have more than once asked "Another Protestant and Architect" to mention the Gothic building that is of equal or surpassing beauty to the Parthenon. To do so ought not to be difficult to any one who in a controversy such as this could write "that the highest form of the beautiful in architecture is to be found only in the rigid Doric of the Parthenon is the sublimest nonsense your pages can contain," were it not that Gothic opinion, like the Gothic style, "admits further development," the same writer writing a month afterwards that "all admit the inimitable beauty of the Parthenon." I have also more than once asked him, if the Goths have produced a greater work than the frieze of the Parthenon, can he tell me its local habitation and its name. To answer this ought not to be difficult to one who in this controversy has written that greater things have been done in sculpture, also in science, poetry, and mathematics, than had been done by the Greeks, were it not for that "variety for which Gothic is conspicuous," the writer's conclusion having now varied to—"I believe that the feats performed by the intellectual athletes of Athens have never been excelled." And to me it is satisfactory to find that in sculpture, at all events, his latest opinion is approached by that of Mr. Ruskin: "in Greek the human sculpture is perfect"—that celebrated critic not condescending to characterise the sculpture of lions, horses, and centaurs. I have more than once asked "Another Protestant and Architect" to prove what he says that "even Mr. Thomson goes back for inspiration to the Egyptian." He has little difficulty in doing this. He "developes" Egyptian into "Greco-Egyptian," and quotes Mr. Ruskin. The authority in whom he has such "Boswellian faith" says that "Greek and Egyptian ornament is mere superficial work, languid and lifeless," and "Greek" and "Egyptian" being joined by a copulative conjunction, and this followed by a verb in the singular number (grammatically enough), "the above is explanatory of my speaking of the Greco-Egyptian style in the works of Mr. Thomson." But Greco-Egyptian, whatever that may be, is not in question, and as the greater contains the less, a style is something more than the mere character of its ornament. "Another Protestant and Architect" says that "even Mr. Thomson goes back for inspiration to the Egyptian." I, however, find nothing about either Egyptian or "Greco-Egyptian" in the following opinions of Mr. Thomson's works, given by gentlemen perhaps as well qualified to judge as is "Another Protestant and Architect."

At the London Architectural Association, Mr. Burges, an eminent Gothic architect, thus concluded a paper on "The Architecture of the Future":—

"Let me ask you to devote some time to the drawings of Mr. Thomson, of Glasgow. They represent buildings in Greek architecture, but certainly the best modern Greek architecture it has ever been my lot to see. . . . Mr. Thomson's excellent designs suggest to me a question which we might all ask ourselves whenever we turn out a design—viz., 'What would the Greeks have thought of it?' If answered unsatisfactorily, would it not be better for us to try again?"

Mr. Edward W. Godwin, in a paper read before the London Architectural Exhibition Society, thus speaks of the works of Mr. Thomson:—

"In church architecture, the Classic school is strongly represented by Mr. Thomson, of Glasgow, who contributes three or four designs, possessing far more of the genuinely picturesque character of old Greek work than anything I know of the ecclesiastical work of the school to which they belong."

At the annual meeting of the Northern Architectural Association, held at Newcastle-on-Tyne, the Vice-President remarked:—

"I am no partisan of either side in the battle of the styles; for I hold that bad buildings are more frequently due to the want of art in their designers than to any insurmountable peculiarities of the style they affect. As a noteworthy example of this, I beg to mention the entirely successful designs of Mr. Thomson, of Glasgow, in that, perhaps, least plastic of all styles—the Greek." The Vice-President adds:—"I cannot pass Mr. Thomson's name without a reference to a paper by him in vindication of his favourite style read before the Glasgow Architectural Society. I consider it one of the ablest papers of the year in connection with our art."

Much of "Another Protestant and Architect's" argument seems to be founded upon the arrogant assumption that Greek can have no freedom, while Gothic "must have liberty withal, as large a charter as the winds." Gothic is free as the wild Indian is free, but Greek is free under order and Government—free to those who have drunk in the spirit, not merely looked at the letter; "as broad and general as the casing air" to the born poet who has genius to conceive and express, although it may be "cabin'd, cribb'd, confin'd, bound in," to the made rhetorician, to whose first care in "poetry" would be a foot-rule of trochees and dactyles. If the Greeks had had to design for such multifarious society as is ours—to clothe our naked and barefaced utilities with the true and the beautiful—in what spirit would they have done it? Does Greek cease to be Greek merely because it has been successfully applied to churches, villas, warehouses, or stables? Is not Mr. Thomson's warehouse in Union-street, or Mr. Burnet's at Madeira-court, as thoroughly Greek as if it had been built in Athens in the time of Pericles; as thoroughly Greek as Sir George Scott's Glasgow University, or Mr. Street's design for the Law Courts is Gothic?

But it is the misfortune, if not the fault of Greek architecture, that it is perfect—"the Greek seems rigidly inimitable in its beauty"—"the perfect Doric of the Parthenon"—the inimitable beauty of the Parthenon"—"its inimitable perfection in virtue of which you cannot deviate from the design but to the ruin of its beauty," although a month before there was written by the same pen—"that the highest form of the beautiful in architecture is to be found only in the rigid Doric of the Parthenon is the sublimest nonsense your pages can contain;" and because of its perfection it "admits no further development;" and if man be "the paragon of animals," he will admit no further development by Dr. Darwin. But although that which is perfect may admit no further development, it may admit further application—that is, by those who know how to apply it, for it is less easy to apply Greek than Gothic; but then that is not the Greek's fault. Because that the Greek architecture is perfect, or rather, nearer to perfection than any other, is the reason why I said that if any consideration is given to the plea sometimes urged that to the Church ought to be given nothing less than the best achievements of human genius, then Greek architecture must be much more appropriate than Gothic. Yet see how much more ingeniously than ingenuously this is put by "Another Protestant and Architect:" "I feel assured that Greek shorn of the glories of its pillars and its sculpture is hardly worthy of the name; if this be the style Mr. Gildard desires to see in all our churches, where is the genius he proposes to lay upon the altar?" I propose to lay no genius upon the altar. I say now, as I said before, that I look upon Christianity as independent of architecture as a fine art, as independent of Greek as of Gothic. But were it dependent in any wise upon fine art, it assuredly should have the best.

"Another Protestant and Architect" "believes with Mr. Honeyman that the path of Scottish church architecture has been one of progress," yet Mr. Honeyman said that "it might be fairly questioned whether, after all (having regard to the special requirements of the building), the Classic style is not absolutely the most suitable for a Presbyterian place of worship." The opinion of Mr. Honeyman, with his large and varied experience in church architecture, is well worthy of consideration, and, when elected President of the Glasgow Architectural Society, he said, in an occasional address, "I had hoped for better things from the revival of Gothic architecture than we have yet seen; but if this revival is to lead to nothing better, I fear there may be too much truth in what a distinguished predecessor in this chair affirmed, that Gothic was but a fashion, the rage of the day, doomed soon to pass on to oblivion or contempt, like the patches and periwigs of the past, or the crinolines and chignons of the present."

"As to the structural superiority of Gothic, Bartholomew says over and over again, 'The dynamics of Gothic architecture outstrip in their combination of economy and skill and beauty all other efforts of the architectural practitioner, ancient and modern.'" ("Another Protestant and Architect" seems also to have "a Boswellian faith in authorities.") An eminent architect, who probably knows as much of what he is writing as does Bartholomew, says, "Every stone in an arch is a wedge, and every stone about it is a hammer, slowly it may be, but surely, driving these wedges home. There can be no doubt of the fact that the introduction of the arch into architecture has strewed Europe with ruins; whilst in Egypt and Greece, except where deliberately [or accidentally] injured or destroyed, we have lintelled structures which have stood the test of thousands of years without showing an open joint or any other symptom of decay, further than natural disintegration." As "Another Protestant and Architect" has the gift of prophecy, he can perhaps mention the Gothic building that when two thousand years old will have had retained to it as much of its constructive economy as has now the Parthenon.

"But the Parthenon is not legitimate architecture, because its glory is in its sculpture, and that is imitative, not creative art; Greek architecture is not legitimate, inasmuch as it is the imitation of timber construction." Now, although "every genuine style of architecture has carried its sculpture along with it as a proper component element essential to the completeness of every important monumental edifice, and the Greek is the only style which harmonises with the highest style of sculpture," in the first place, the glory of the Parthenon is in itself—"the perfect Doric"—the inimitable beauty of the Parthenon;" and in the second place, sculpture is not imitative, but creative art—the fable, argument, or motive, the grouping and composing, the action and expression are no less "creative" on a sculptured frieze than in a written drama or epic. And, again, it is open to question whether Greek architecture is the imitation of timber construction. It is no more likely than in the construction of Stonehenge. It was not of Greek architecture that Sir Walter Scott, to whom Gothic for its revival is infinitely indebted, wrote—

> Thou would'st have thought some fairy's hand,
> 'Twixt poplars straight, the osier wand
> In many a freak had twin'd.

And although Greek architecture were the imitation of timber construction, of what is this timber construction the imitation?

Of Gothic sculpture, the fashionable Gothic architect of the time, Sir George Scott, seemed to know the value when he sought Classic in his design for the London memorial of Prince Albert. Of Gothic ornament, the fashionable Gothic critic, Mr. Ruskin, says that it "stands out in prickly independence, frosty fortitude," &c., and that "we can no more expect to derive pleasure and profit from an architecture whose ornaments are all of one pattern, and whose pillars are all alike, than we should from a universe where the clouds are all of one shape." As ornament is not an essential, but an accessory, it is not its province to be independent. Its chief office in architecture is to enrich—like "words that clothe the idea, not disguise"—and less in the particular than in the general. Arising from the character of the moulding on which it is imposed, it enriches it in turn—not as "to throw a perfume o'er the violet, a wasteful and ridiculous excess," but rather "like the sweet south that breathes upon a bank of violets, stealing and giving odour." That we cannot expect to derive pleasure and profit from an architecture whose pillars are all alike is as much as to say that a building is not to be looked upon as a whole, but is to be seen as a piece of patchwork, bit by bit, pillar by pillar, slate by slate; that it has been put up in lots to suit visitors, one man's "taste" being a boss of thistles of prickly independence, and another's a corbel of kail of frosty fortitude.

A part of "Another Protestant and Architect's" letter professes to be "explanatory of his speaking of the Greco-Egyptian style in the works of Mr. Thomson," from which it now appears that when he wrote—"the solemn porticoes and general rectangular, heavy, unnatural stiffness of the Greco-Egyptian style are too suggestive of the abodes of imperial mummies to be ever very popular with country gentlemen of the nineteenth century," he directly referred to the designs of that architect. If he has seen Holmwood Villa, either in stone and lime, or as illustrated in a book by Messrs. Blackie, of Glasgow, he has seen an architectural work full of Greek spirit in alike its composition and detail, and that has neither solemnity, heavy unnatural stiffness, nor suggestiveness of the abodes of imperial mummies, but in which, by that knowledge which is power, "the very narrow limits within which variety is possible in Greek" (to those with very narrow limits of originating) have been broken through, and the style is shown to be no less applicable to a cheerful home, replete of elegance and refinement, and an exquisite grace that the Gothic never knew, than to the solemn temples. But then Holmwood Villa is not by an architect whose solemn temples are made more solemn by having their roofs concealed by plaster.

As to the "metaphysical" distinction between "nature" and "humanity," Judge Haliburton has been before me in "Nature and Human Nature"—much of the same thing.

And because that "the beauty of abstract lines has interest only for the few, but the beauty of nature is felt and understood by all," I suppose the architect is to pander to the "all"—that all whose chief interest in art is in the portrait of her Majesty upon a shilling. As Professor Poynter puts it—"What they desire, in fact, is an art which shall appeal more directly to minds incapable of appreciating its more elevated characteristics; and this, they persuade themselves, would be a higher development, because appealing to a wider range—of what?—not of sympathies, as they imagine, but in truth, of minds incapable of wide sympathies." . . . "It is essential to the very existence of an art that it should have an ideal of beauty;" and no style ever has had such an ideal of beauty as has the Greek.—I am, &c.,

Glasgow, November 16. THOMAS GILDARD.

ANOTHER SKETCH BOOK.

SIR,—I hail with gladness the recent suggestion of another BUILDING NEWS Sketch Book, as, I am sure, do nearly all of your readers. When, however, matters of detail come to be discussed, I do not find the same unanimity. Some propose that it shall be carried out like its successful predecessor; others that it shall consist of measured line drawings only. Objections are urged against this latter proposal which I need not here quote. I refer in particular to "H.'s" letter, last week. This is a case in which it might well be said—"How happy could I be with either, were t'other dear charmer away." This, however, does not solve the difficulty. I have pleasure in voting for a Sketch Book consisting of measured examples, and (as a previous correspondent suggests) that "sketches" be only admissible in so far as they are explanatory of the other drawings. As regards classification, I vote that it be an afterwork. Will not the foregoing practically secure both "charmers"?—I am, &c.,

AIDE-TOI.

LAND AND BUILDING SOCIETIES.

BIRMINGHAM FREEHOLD LAND SOCIETY.—The twenty-fifth annual meeting of this society was held on Tuesday week. The report set forth that the receipts for the past twelve months have been £27,318 6s. 2d., thus making the total income £358,318 4s. 2d. The gross profit of the year, including the amount brought forward, is £7,516 0s. 6d.; and after payment of interest to depositors, placing interest at the rate of £5 per cent. per annum to investing members' accounts, and discharging all current working expenses, the balance in favour of the society is £5,049 2s. 9d.

THE LEEDS PERMANENT BENEFIT BUILDING SOCIETY.—The following is the substance of the report of the directors to the twenty-fourth annual meeting of the members of the society, which is to be held on Thursday evening, December 5th:—The increase of members during the past year is unprecedented, and the increase in the number of shares held is beyond that of any former year. To show what rapid progress the society is making, a comparison of the past year's operations with the year ending November, 1869, has been made, with the following results:—Increase of contributions, £53,226 1s. 6d.; do. loans, £18,485 6s. 10d.; do. entrance fees, £313 10s. 8d. The total increase in the society's income during the year, as compared with the income three years ago, is £76,633 16s. 3d. This great development of the society has been accompanied by a corresponding benefit to its members. On the 2nd November, 1872, there was a surplus of £2,506 10s. 8d. Out of this sum the directors recommend that 2s. 11d. per share be paid to those members entitled to the same until the next annual meeting.

FOURTH CITY MUTUAL BUILDING AND INVESTMENT SOCIETY.—The tenth annual meeting of this society took place on Monday evening, at the City Terminus Hotel, Cannon-street. The chair was taken by the Lord Mayor, who was supported by several of the directors of the society. The report stated that during the past year the amount received on investing shares was £10,730 15s. 4d.; the repayments on advances amounted to £28,264 17s. 11d.; the amount received on deposit was £28,110 15s. 4d.; and the balance to the credit of profit and loss account was £4,859 6s. 10d., out of which the directors had declared a dividend on the investing shares at the rate of 6 per cent. per annum. The balance standing to the credit of the deposit account to Sept., 1871, was £34,228 10s. 3d.; and at the end of the past year the amount was increased by £9,294 0s. 3d., the balance then being £43,522 10s. 6d. As a proof of the great advantage the society had been to the investing members, it might be stated that the amount paid to them for interest only, since the commencement of the society, was £34,908 11s. 3d., in addition to the dividend now declared, which would amount to about £3,700. The total amount paid for interest on loans and deposits was £13,129 6s. 5d.

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The demolition of the old church of S. Martin, Birmingham, is being rapidly proceeded with.

The foundation stone of a new Temperance Hall, to cost £338, was laid at Bristol, on Monday. Mr. Scamp, of Barton Hill, is the builder.

Intercommunication.

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QUESTIONS.

[2704.]—**Preserving Joiners' Work.**—Will any reader kindly give his opinion as to the best manner of preserving joiners' work fixed in a building which is intended to be stained and varnished?—T. C. H.

[2705.]—**Barytes in Paint.**—What object is gained by using this mineral in paint, and how is its presence to be detected?—WHITELEAD.

[2706.]—**Tar Paving.**—Will some of your numerous readers kindly give me, in detail, the best method of tar paving?—J. T. J.

[2707.]—**Coloured Architectural Drawings.**—Where can I obtain good examples of coloured architectural drawings for my private practice and study in colouring—something really useful?—PROGRESS.

[2708.]—**Duties of Surveyors.**—Supposing a surveyor is employed in getting up the usual preliminary surveys for a projected railway in the Midland counties, or elsewhere, and is otherwise engaged in the interests of the company until the Bill is passed, does it seem consistent (leaving professional etiquette out of the question) for him to go touting for commissions amongst the landowners to treat for sale in their behalf with the aforesaid company with whom he has previously been and may now be acting?—OBSERVER.

[2709.]—**Brickmaking.**—Will any of your correspondents kindly inform me of the best and cheapest way in which to make bricks? Owing to the increasing price of stone in this district, I find it necessary to use a larger quantity of bricks. The clay of which I intend to make the bricks is composed of about three parts of clay and one of sand. I shall feel greatly obliged if any one will kindly state whether it would be cheapest to make by hand or by machinery. The cost of making them by hand is about 14s. per m. for labour only. Will you state about the cost of making by machinery, and what machine is the best and cheapest?—D. & L., Colne.

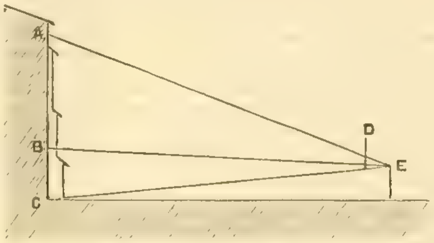
[2710.]—**Building in Concrete**.—Will some one give me some particulars as to the expense of machinery, &c., used in building with concrete?—AN OLD SUBSCRIBER.

[2711.]—**Belfry Lights.**—I have been somewhat dogmatically informed by one of larger experience than myself that a combination of three belfry lights is not correct. Whether as viewed from the light of precedent, or from a structural point of view, a reason was not vouchsafed. My own observation leads to the following conclusions:—1. That the combination is the exception in Mediæval examples rather than the rule. 2. That it is, in modern examples, much less of a rarity. Mr. Street makes frequent use of it, a notable instance being the great tower in his design for the New Law Courts (Embankment site). I notice, however, that Mr. Street frequently panels what would otherwise be the two outer lights. 3. In a structural point of view I have been unable to find in it any special disadvantage. Will any correspondent confirm (or otherwise) my views in a more satisfactory manner than my dogmatic informant?—AIDE-TOI.

[2712.]—**Sanitary Matters**.—Can any of your readers kindly give me the name of town and any other information in respect of air-tight vessels for emptying cesspools in use in some parts of Germany?—SURVEYOR.

REPLIES.

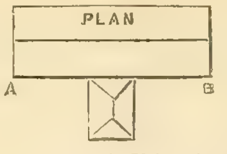
[2668.]—**Measuring the Height of Chimney Stacks, &c.**—In the BUILDING NEWS for April 10, 1868, p. 251, appeared the following method for measuring the heights of inaccessible points. Having already measured some accessible height B C, which is (say) 8ft., stand some distance off and hold a rule upright at D (E being the eye), the height B C will cover (suppose) 2in. of the rule, and the whole height A C will be covered by an exactly proportionate length. Then looking up to the point A, supposing the whole height covers 6½in. Then 2in. : 8ft. : : 6½in. : 26ft. the height of A C.—C. W. F.



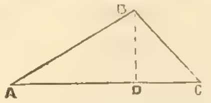
[2675.]—**Books, &c., for Articled Pupils.**—Before attempting to answer the questions which have appeared on this head, it is worth while to remark how very much information on all sorts of architectural questions can be extracted from the professional journals; yet I fear much of it is practically wasted, because it cannot readily be found when wanted. My own plan is to sort the articles as they come out. I have a set of blank paper books in which every two leaves are pasted together at the top and bottom to form pockets; these pockets are lettered from A to Z through the volumes, and I write the names of subjects on them in their proper place alphabetically. Each article, as it appears, is cut out and transferred to its appropriate receptacle, and I can find in a moment all the information which the BUILDING NEWS has given on that particular subject. In this way a useful, and often a very complete treatise, is obtained on most of the branches of building. As the articles are published—in a disconnected form, and at long intervals—one reads them and forgets them; or, perhaps, if they are on a subject with which one has no special concern at the time, does not read them at all. Sooner or later, however, most of them prove to be valuable, and it is an immense advantage to find them at a moment's notice, all ready to hand. In the way thus described—though it is, perhaps, far from the best that could be invented—I find myself coming into possession of an architectural cyclopædia more thorough and practical than any which has been published in a separate form, and with the great merit of being always corrected and improved down to the latest date. Amongst the heads under which much useful matter has accumulated are "Asphalte," "Bricks" (quality, strength, and manufacture of), "Brick Churches," "Brick Architecture," "Carpentry and Woodwork" (a very important series), "Cement" "Chimneys, Factory and other, and Flues," "Concrete Building" (facts and correspondence which can be obtained nowhere else), "Coloured Decorations," "Church Arrangement," "Dilapidations," "Drainage of Towns, Houses, and Fields," "Domes," "Drawing," "Foundations," "Fireproof Construction" (facts about nearly all the systems ever adopted), "Glass and Glass Painting," "Grates and Stoves," "House Planning," "Heating Apparatus," "Iron Girders, Wrought and Cast," "Iron Roofs," "Ironwork, Design of," "Iconography," "Limes," "Lightning Conductors," "Metalwork," "Mortar," "Masonry" (an excellent and practical group of papers), "Mouldings," "Organs," "Plumber's Work" (a series in which, by the way, I should be glad of practical information about water supply, closets, and sanitary apparatus), "Schools and School Planning," "Staircases," "Strong-rooms and Safes," "Slates," "Tiles," "Terra-cotta," "Varnishes," "Ventilation," "Walks, Construction of Gravel," "Walls, Hollow," and a multitude of minor matters which I have passed over in the list. The articled pupil who has familiarised himself with all you have published on the above points will be by no means backward in the study of his profession, and with this remark I will proceed to the question of books. I may first remark, however, that those who have the BUILDING NEWS bound would gain most of the advantages described if they would make and fill up from week to week an index of subjects embracing all the volumes. I find, on referring to the appropriate heading in my list, that a somewhat extensive catalogue of "Architectural Works at the South Kensington Museum Library" appeared in the BUILDING NEWS of January 26th this year. Strictly elementary works, however, belong to a different class; though I have no great faith in books that are "adapted," as the phrase is, "to the meanest understanding." The student, however young, will do well to study the best books he can get, and ask or search for information about those points in them which may as yet be too hard for him. Perhaps the most thoroughly useful work that can be named as embracing the whole range of an architect's business strictly so-called is Viollet le Duc's "Dictionnaire Raisonné de l'Architecture." It is so universally known that it is, perhaps, superfluous to mention it. Its style is marvellously lucid, and so are the multitude of drawings by which all constructive details are explained. If I were to recommend a pupil to buy *one* book, it would certainly be this, even if he had to spend a few weeks in learning French enough to read it. As a rule, architectural knowledge is not, and perhaps cannot be, acquired so much by reading as by studying actual buildings and careful drawings of them. Some of the best architectural publications have no letter-press at all, simply scale drawings and views. On construction, beyond Viollet le Duc, I know very few works that are quite satisfactory. Tredgold's "Carpentry," if used with discrimination, may teach something; but the student must remember that Tredgold's knowledge was almost limited to the mediocre work of his own times, and that there is a whole world of wood construction, of the highest class, which he had scarcely heard of. Dempsey's "Builder's Guide" is a useful little book as far as it goes—that is to say, the modes of construction which it recommends are better than the pupil would be likely to devise by the light of nature, though much more admirable ones may often be found in old buildings. It is the vice of most modern treatises on construction that they are written by men who ignore all construction except the trumpery sort now in popular use, and who, instead of explaining how to build well, merely explain how to build according to the most debased practices of the trade. Really good construction may be learned with far more certainty from old buildings, for time has destroyed long since all that were originally faulty in this respect. Dobson's "Art of Building" is a more elementary book than Dempsey's, but the same remarks apply to it. Mr. Burges's lectures on glass painting and other subjects are very good and suggestive. Paley's "Essay on Mouldings" is a valuable little book for the student, so is Mr. Sharpe's "Window Tracery," and so also are the small volumes on architecture and ornament published by Mr. Parker, of the Strand. Architectural knowledge, however, has to be extracted from an immense number of sources—not by reading, but by examination of plans and drawings, by comparing one with another, and, above all, by measuring and sketching actual work. Brandon's "Analysis," Parker's "Glossary of Architecture," and Rickman's, Bloxam's, or Paley's "Manuals of Architecture," may help to show the pupil, in the first instance, how this may be done. Fergusson's "History of Ancient Architecture" gives a general notion of all the styles ever practised in different ages and countries, and shows their relation one to another. It is, perhaps, the best book in existence with this particular purpose, but it does not go into detail. Detail, however, whether constructive or decorative, is an essential thing, and must be studied bit by bit from separate works. Willis's "Treatise on Vaulting" explains the formation of vaults, and throws a light on the main construction of the most important Gothic buildings everywhere. Garbett's "Elementary Treatise on Design" also contains some short but lucid explanations of this and allied subjects, with much ingenious theorising, which will not always bear the test of facts Murray's "Handbooks of the English Cathedrals" form a very good introduction to the study of those important monuments, and Bowman and Crowther's "Churches of the Middle Ages" and Brandon's "Parish Churches" will do the same to the buildings to which they relate. Mackenzie Walcott's "Church Arrangement" contains a great deal of valuable matter in a small space; but, like Liebig's extract of meat, it wants diluting and flavouring to make it palatable. Gailhabaud's "Monuments," a quarto in five volumes, contains fine plates of very fine buildings, both in France and elsewhere. Johnson's "French Architecture" and Nesfield's and Norman Shaw's "Sketches" do the same, and Mr. Burges's book of measured drawings of French work, lately published, is a guide to the practical minutæ of many items of Mediæval detail. Mr. Street's works on Italy ("Brick and Marble Architecture") and Spain are invaluable, and comparatively inexpensive. Domestic architecture may be well studied from Verdier and Cattois' "Architecture Civile et Domestique," and from Turner and Parker's "English Domestic Architecture." Revoil's "Architecture Romane du Midi de la France" has a splendid series of examples of the most refined Romanesque work; and this and Darteiu's "Architecture Lombardo-Byzantine" are worth their cost, if it were only to show the student what architectural drawing is really like. Mr. Ruskin's architectural works, the "Seven Lamps" and the "Stones of Venice," ought to be read by every student, not because he will get any vast quantity of facts out of them, but because they will give him a noble conception of what his art has done in the past, and may do again. One other suggestion occurs to me—not on the books that are most worth obtaining, but on a supplement to books, which may in some cases supersede them altogether. It is now twenty or thirty years since buildings were first photographed. Photographs of them are incomparably more accurate and expressive than drawings, and yet, with the exception of Seddon's "Rambles in the Rhine Provinces" and two or three others, they have never been applied to architectural books. These photographs cannot usually be obtained as they are wanted. For instance, I am now in want of some of Mayence Cathedral, and do not know where to get them. They must be picked up, one by one, as they happen to make their appearance in the shops, no matter what is the building they illustrate, so long as it is a good one. They may often be bought for a few pence each, some of them as stereoscopic slides, some of them of carte de visite size, and some as unmounted scraps. In this way, accurate views of the most interesting buildings of Europe, and even of Asia, may, in course of time, be brought together; not mere elevations, but views from all positions, which very often serve to explain each other. Then, for the best way of using them. One picks up, perhaps, in this way, two or three exterior and interior views of some important building, say Chartres Cathedral. The next thing, if one has never been there, is to find a plan of it, perhaps in Fergusson's History, or Viollet le Duc's Dictionary, or King's "Study-book of Architecture" (which, by the way, has an admirable collection of French, German, and Belgian Churches), and to make out the different points in the photographs from the plan. A small magnifying-glass is very useful here, and as we use it we shall see how much more beautiful are the details of the work, as photography shows them to us, than we should be led to suppose from any woodcut, or even engraving. But the great gain in comparing plans and sections with photographs is the clear understanding which it gives of the design, of the way in which the architecture grows out of the planning and construction, and in which the differences of arrangement which characterise different ages and countries shape themselves into conspicuous differences of external outline. As photographs of particular buildings accumulate in this way, it is well, as opportunity offers, to look through such a library as the South Kensington one for information about any of them which are interesting. We may thus make slight but useful sketch plans or sketch sections, with notes about the date, the materials, the dimensions, and many other points of interest, and so put together, in time, at very small cost, a series of valuable little monographs of some of the finest buildings in the world. This does not do away with the necessity for seeing the buildings, but it is the best of all preparations for it, and gives double interest to them when they are seen. Unfortunately, it only seems practicable with regard to cathedrals and works of similar magnitude, as photographers apparently think parish churches and domestic architecture beneath their notice.—C.

[2697.]—**Colours to Represent Materials**—Roofing slate, indigo and lake; ridge tile and eave spouting, indigo; flooring tiles, crimson lake (very light); Yorkshire hearths and landings, Prussian blue or cobalt. The same colours will do for plan, &c.; the section much darker.—T. C. S.

[2699.]—**Construction of Roof**—Your correspondent has evidently been stealing a march on the architects, and now finds himself "in a hole"—not a very deep one, indeed, as any carpenter can answer his question about the "spars." If he gives up the idea of running the porch into the main roof, and "hips" the former, he can then get the water from A to B without any difficulty.—IGNOTUS.



[2700.]—**Surveying.**—The usual method of finding the area of a triangle when plotted is $A C \times \frac{B D}{2}$ = area. If correctly plotted, $A B^2 + B C^2 = A D^2 + D C^2 + 2 (B D^2)$. This calculation is soon done by means of a table of squares, as it is simply a matter of addition. If the triangle be not plotted, then, by calculation, $A B : A C :: B D : B C$, therefore $\frac{A B \times B C}{A C} = B D$. Having B D, proceed as before for the area—viz., $A C \times \frac{B D}{2}$. "C. W. F." will find this process in most cases somewhat shorter than the formula given by him. A scale of 4 chains to the inch will answer his purpose, but 6 chains to the inch could be used if the plotting were carefully done.—KARL.



[2700.]—**Surveying.**—After you have plotted your plan, run a perpendicular from the base line to the opposite angle; then multiply the base and perpendicular together, divide the product by 2, and the quotient will be the area. About half a chain to 1 inch. 100 links to a chain. Only by logarithms.—T. C. S.

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LEGAL INTELLIGENCE.

COUTTS' BANK AND MR. E. W. PUGIN.—On Thursday week Mr. Glasse, on behalf of Messrs. Coutts & Co., bankers, applied to Vice-Chancellor Malins, in London, for an injunction to restrain Mr. Edward Welby Pugin, architect, of Ramsgate and London, from holding himself out as a partner of the firm. It appeared that Mr. Pugin had mortgaged the Granville Hotel at Ramsgate to the firm for the purpose of securing the repayment of various advances, amounting altogether to over £100,000, and that Mr. Pugin having failed to repay the advances the firm entered into possession of the hotel, whereupon he threatened that he would do them some serious injury. Subsequently he wrote to the firm, stating that in consequence of difficulties, and the pressure of creditors, he was about to sign a petition, that he might be adjudicated a bankrupt, in which petition, a copy of which he had forwarded to them, he described himself as a partner of Coutts & Co., in the character of hotel-keepers and wine merchants. The motion was ordered to stand over till the second seal day after term, to allow Mr. Pugin an opportunity of adducing evidence in support of his allegation that he is a partner of the firm.

POLLUTING A CANAL.—Vice-Chancellor Bacon had before him on Monday the case of the Warwick and Birmingham Canal *v.* Burman. It was a suit to which Mr. Burman was made defendant, as representing for legal purposes the Local Board of Health of Balsall Heath, a district near Birmingham, the object of the suit being to prevent the Board from continuing to pollute the canal by discharging sewage into a stream called Spark Brook, which faces the canal. The matter was some time ago before the Court, when the Local Board gave an undertaking to take steps to abate the nuisance. The plaintiffs now moved for an injunction, on the ground that nothing effective had been done by the Board.—The Vice-Chancellor granted an injunction, not to be put in force for two months, in order to give further time to take effective measures to abate the nuisance.

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S. PAUL'S.—The *Athenæum* hears with dismay that a plan is under consideration for decorating the spaces under the apsidal windows of S. Paul's with intarsia work, such as M. de Triqueti designed with lamentable, not to say ridiculous, results for the walls of Wolsey's Chapel, at Windsor. Our contemporary does not object to the use of intarsia work in S. Paul's, in the place proposed, provided that it is designed and executed by competent artists, but is of opinion that if anything approaching the panels at Windsor, in weakness of design, conception, and execution, be placed in S. Paul's, the result will be to add another to those blunders which, it had hoped, ended with the wretched glass transparencies in windows which presented a magnificent opportunity for decorative art.

Our Office Table.

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LONDON INTERNATIONAL EXHIBITION, 1873.—The first meeting of the Committee on Recent Scientific Inventions and Discoveries was held on Wednesday last, in Stanhope Lodge, Kensington Gore. Among those present were, Major-General H. D. Harness, C.B., Dr. C. W. Siemens, F.R.S., Dr. E. Frankland, F.R.S., Dr. D. S. Price, Mr. J. Ramsbottom, Mr. C. F. Beyer, Major Donnelly, R.E., and Major Frank Bolton. It was considered that the class should consist of objects the excellence and novelty of which are considered by the Committee of Selection to be so great as to render it undesirable that their introduction to the public should be delayed until the proper year for their exhibition as an industrial manufacture. The committee suggested as special subjects for exhibition in the class all new modes of preserving stone, or of rendering wood incombustible, or of purifying water, or of copying forms in wood or metal by machinery, &c. The applications for admission it is arranged must be sent in before the 31st January, 1873, and the goods delivered on the 12th March, 1873.

ROYAL ARCHITECTURAL MUSEUM.—The first session of art-workmen's drawing and modelling classes will be opened at this Museum on Monday evening, December 2, at 7 o'clock, p.m., and will be continued on each succeeding Monday, Wednesday, and Friday, evening, until Friday December 20. Admission, 6d. per week, payable in advance—entrance fee (payable on entering name), 2s. 6d., which will extend over a whole year. The second session will commence after Christmas, when a course of practical descriptions of the figure sculpture in the Museum will be given by Mr. J. F. Redfern. A course of practical lectures on metal work will also be delivered by Mr. Joseph Peard.

ROYAL ACADEMY LECTURES.—A few cards of admission to these lectures have been placed at the disposal of the Council of the Royal Institute of British Architects, and may be had on application to the secretary.

FREEING THE LONDON BRIDGES.—Colonel Hogg, M.P., headed a deputation of the Metropolitan Board of Works on Saturday, the object of which was to ask Mr. Gladstone and Mr. Lowe to aid the Board in freeing the whole of the London bridges from toll by means of a further continuation of the coal and wine duties. These bridges are about twelve in number, and include, besides the bridges over the Thames, one over Deptford Creek, and one or two over the River Lea. The Prime Minister promised that the representations made should be well considered, and that the Cabinet should be consulted upon the matter.

SANITARY OFFICERS.—The *Saturday Review*, in an article on the New Public Health Act, says it remains to be seen how far the local authorities will be induced by the prospect of having half the salaries of their officers paid out of the Imperial revenue to fall in with the wishes of the Local Government Board. It may probably be taken as certain that the majority of them will do so without hesitation. It will be so clearly better, for example, that three sanitary districts should unite to pay a medical officer £150 a year, the Local Government Board making up his salary to £300, than that these same parishes should pay £100 a year each to three inferior men, the Local Government Board contributing nothing, that even the average ratepayer may in the end be trusted to take the right view of his representatives' duty in the matter. The sanitary authorities which may be expected to reject the offer of the Local Government Board are of two kinds—a few large towns, proud of their successful sanitary administration hitherto, and resenting anything that even looks like a suggestion from without; and districts in which, either from sheer obstinacy or from a corrupt desire to keep off prying eyes, the authorities prefer paying the whole salaries of incompetent officers to paying half the salaries of competent officers. As regards the former class, no harm can come of their refusal.

THE BIRTHPLACE OF POPE.—"F. S. A." writes:—Readers who are interested in such subjects may be glad to be informed of the melancholy fact that the old house in Plough-court, Lombard-street, in which the poet Pope was born and reared, and where first he "lisped in numbers," is being pulled down, and that by the end of the present week not a vestige will remain of the old shop front in which the elder Pope exhibited his haberdashery. The shop continued to be a haberdasher's until a comparatively recent date, after which it was occupied by a firm of well-known chemists.

THE BUILDING NEWS.

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LONDON, FRIDAY, DECEMBER 6, 1872.

THE SOCIETY OF ARTS.

WITH the exception of the Royal Society (which was originated in 1645, and incorporated by Royal Charter in 1663) and the Society of Antiquaries (founded in 1707, incorporated in 1751), the Society of Arts is the oldest of our learned societies. The Royal Institution is forty-five years its junior, the Literary Society sixty-nine years, the Geological fifty-three, the Geographical seventy-six, the Institute of Engineers sixty-four, of Architects no less than eighty years, while it did fourteen years' good service for Art before the Royal Academy existed. Though it has now reached the respectable age of one hundred and eighteen years, the Adelphi institution gives abundant evidence of being quite as vigorous as the youngest of its fellows, while no one will say that its career has been less useful or successful than any of theirs. It would be difficult, indeed, to estimate the value of the benefits conferred upon mankind through its means since patriotic Mr. William Shipley, drawing master in the Strand, and brother of the Bishop of S. Asaph, set on foot this scheme of his touching arts, manufactures, and commerce in 1754, the year, by the way, James Watt, then a young man of eighteen, of whom the world had not yet heard, came to London to work in the shop of a mathematical instrument-maker. The first meeting of the Society was held on the 29th of March in Rawthmell's coffee-house, Henrietta-street, Covent-garden. The pioneers numbered only a dozen, and included Lord Folkestone, Lord Romney, the Bishop of Worcester, the Rev. Dr. Stephen Holes, and Shipley himself, who acted as secretary. They put forth an address to the public, which is worth quoting: "Some of the nobility, clergy, gentlemen, and merchants, having at heart the good of their country, have lately met together in order to form themselves into a society for the encouragement of arts, manufactures, and commerce in Great Britain, by bestowing rewards from time to time for such productions, inventions, or improvements, as shall tend to the employing of the poor, to the increase of trade, and to the riches and honour of this kingdom, by promoting industry and emulation; and though at present their plan is not complete, yet it has, nevertheless, been resolved to make a beginning in manner following—viz., for cobalt, madder, and drawings, &c." We have only to reflect on what was the condition of England at this date in order to appreciate the object of the founders. Without entering into particulars, it may be stated generally that the state of the country with respect to the arts, the manufactures, and all those things in which the public wealth of the community consists, was at that time considerably inferior to that of Holland, the Netherlands, France, and some of the Italian States. The Society set to work at once to carry out its programme, by offering the following rewards (1) £30 for the production of cobalt found in England; (2) £30 for madder grown in this country; (3) £15 for the best drawing by boys and girls under fourteen, and a similar sum for the best drawing by boys and girls between that age and seventeen. Such was the modest beginning made by Shipley and his friends. What has the institution done since? The true answer to that question is to be found in the Transactions and the Journal of the Society, which extend, we believe, to over one hundred volumes. However, the former publication did not make its appearance until 1784, while the latter only dates from 1851. But before it had completed its second decade the Society had given the following among other rewards: Eight gold and four silver medals for treatises on the culture of wheat, barley, &c.; six gold and five silver medals for the sowing of acorns; eight gold and seven silver medals for the planting of Scotch firs; four gold medals for English elms; the same for chestnuts. Upwards of £1,600 had been granted in premiums to growers of madder, for raising hemp £430, burnet £100, various kinds of grass £245, lucerne £80, carrots £75; for stocks of bees four gold and three silver medals were granted, besides £115 in money; for beeswax £35, and so on. Nine gold medals had been awarded to gentlemen "for eminent services" in connection with the institution, among the recipients being its earliest president, Lord Folkestone, Lord Romney, who succeeded him, and our good friend, William Shipley. The first of these medals was designed and presented to the Society by Flaxman.

Many inventions given to the public, as Mr. Henry Dircks remarks, "have remained unknown, except to scientific readers, until accident has brought them before enterprising manufacturers and others, for more than sixty years, abundant proof of which may be obtained from the Transactions of the Society of Arts." Certainly, in this Society inventors have always found the best of friends and protectors. When attempts were made to introduce saw-mills into this country from Holland they were violently opposed, because it was apprehended that the sawyers would be deprived by them of the means of getting a living. Nearly every useful invention or discovery has, needless to say, met with opposition on similar grounds. In the year 1700, when one Houghton laid before the nation the advantages of such a mill, he expressed his fears that it might excite the rage of the populace. What he dreaded actually took place, as Beckmann tells us, sixty-eight years later, when an opulent timber merchant, by the desire and approbation of the Society of Arts, caused a saw-mill, driven by wind, to be erected at Limehouse under the direction of James Stansfield, who had learned in Holland and Norway the art of constructing and managing machines of this kind. A mob assaulted and pulled the mill to pieces. The damage done was, however, made good by the nation; and some of the rioters were punished. A new mill was shortly afterwards erected, which was suffered to work without molestation, and, thanks to the encouragement of the Society, saw-mills became common all over the country. As early as the year 1760, the Society offered premiums for a machine for spinning six threads of wool, cotton, flax, or silk at one time, and requiring only one person to work and attend to it. The idea was taken up by James Hargreaves, then a poor weaver in a cotton factory near Blackburn, who produced the machine which was the origin of the celebrated "spinning jenny." In 1795, Alvis Senefelder, an actor of Munich, having discovered the art of lithography, first attempted to apply it to the printing of music, but it was not till some years later, and after many failures, that he succeeded in working the process to his satisfaction. The Society in 1819 awarded its gold medal to Senefelder, as the inventor of the process, and its silver medal to his countryman, Hulmandel, for an improved process.

It ought never to be forgotten that before the Royal Academy was constituted the Society aided Art, and before schools of design were thought of it encouraged drawing and painting by medals and other rewards. In the early days of its existence it did much to excite among the nobility and gentry, as well as among the middle and lower classes, a knowledge and love of art, and we find in the lists of competitors for the Society's prizes the names of many sons and daughters of the peerage. The first silver medal was presented in 1757 to Lady Louisa Grenville for a drawing. The reputation acquired by artists whose works were seen and criticised in the Society's rooms, we are told, "occasioned an application to be made for an exhibition to be held in the large room." This was granted gratuitously for several years, and the first public exhibition of the works of British artists in the metropolis was held at the Society's house in the Strand in 1760, and hence arose "the annual exhibitions of the rival artists." There can be no doubt that the Royal Academy sprung from the Society of Arts, since the first programme of the former body, which, as we have said, was formed in 1768, expressly refers to the example of the Society. Moreover, it can claim to having conferred honorary rewards on many of the greatest English artists, such as Nollekens, Sir Thomas Lawrence, Bacon, Flaxman, Mulready, Sir Edwin Landseer, Wyon, Millais, &c. Cosway, the painter, received the first prize ever awarded, when he was only fifteen years of age. His portrait of Dr. Templeman, the Society's secretary from 1760 to 1769, may be seen in the hall at the Adelphi. The late Sir W. Ross, miniature painter to the Queen, obtained his first prize from the Council in 1807, when he was only twelve years of age, for a drawing of Wat Tyler. The total amount distributed in premiums and bounties by the Society exceeds considerably the sum of £100,000. It ought to be mentioned that the Society, after migrating hither and thither during the first twenty years of its existence, ultimately, in 1774, took up its *locale* in the present building, which was erected for it by the Brothers Adam on the site of Durham House, the town residence of the Bishop of Durham. And here there is a curious story to be told. Two years later, that is in 1776, the Society which had done so much for art proposed to the recently-elected R. A.'s that they should paint the Great Council Room in the Adelphi with figures "analogous to the views of the institution," and be remunerated by the public exhibition of their works therein. The Academy, with Sir Joshua Reynolds at its head, refused, which was ungrateful, to say the least. However, James Barry, to his honour be it said, member of the Academy though he was, volunteered to decorate the room, without fee or reward of any kind. When he made the offer he had, it is said, only fifteen shillings in his pocket. The result is before us. The Society was not ungrateful to Barry. He died on the 25th of February, 1805, aged 65. His corpse was placed in the Great Hall, where it lay until the 8th of March, when it was conveyed to S. Paul's Cathedral, attended by the President, the Vice-Presidents, and many members of the Society. The remains of this public-spirited artist were deposited between those of Sir Christopher Wren and Sir Joshua Reynolds. In memory of its deceased friend, the Society of Arts, following the graceful custom observed on the Continent, was desirous in later years to place a commemorative tablet on the house in which James Barry lived, which was 36, Castle-street, Oxford-market. It happens that there are two streets of this name in Oxford-market, each containing a house numbered 36, but which of them the artist resided in cannot be ascertained.

Had the Society of Arts done nothing more than what we have narrated it would be entitled to be considered one of the most valuable of our public corporations. But it has accomplished much more than is included in this imperfect epitome of its labours: it can claim the credit of having given an immense impetus to the movement for improved dwellings for the labouring classes; it has, as we have seen, induced the planting of millions of trees in the United Kingdom; it has encouraged the reclamation of waste lands, improved the education of the people, has taken an active part in improving our postal system, it may be said to have created the straw plait trade of this country, has exposed unjust and injurious monopolies, fiscal restrictions, and laws damaging to trade and commerce. For many years the Society promoted the improvement of our fisheries, and the supply of the metropolis with fish by land-carriage, and it has provided—and is still providing—increased and cheaper supplies of food for the people. It has from time to time raised guarantee funds in aid of public objects, such as the International Exhibitions of 1851 and 1862 (in the latter case the guarantee amounted to nearly half a million of pounds). And all this has the institution done without deriving the slightest pecuniary advantage from any of the objects it has carried out. As a professional contemporary the other day justly observed, it has been the friend and advocate of all classes, and has never taken a fee or given rise to a scandal.

The income of the Society is derived from the subscriptions of from 3,000 to 4,000 members, but it is bespoken every year; the demands upon it are incessant, and it is eager to meet them. Great as are the results it has already achieved, it is anxious to "lengthen its cords and strengthen its stakes," that it may achieve still greater things, and in order to enable it to do this the Society makes an appeal to the public. To quote from the official address we have received, " the Council feel, and have long felt, that compared with the magnitude and breadth of the field for the Society's operation, its action has been necessarily limited, owing to the fact that the Society has never possessed any funded property or endowment, by means of which competent men could be secured to conduct specific lines of investigation in the interests of the arts, manufactures, and commerce. It has at all times expended its annual income at the time it was received, and it is now felt more strongly than ever that if the Society is to continue to extend its work, it cannot hope to do so by means of annual subscriptions alone. It is, therefore, proposed to raise an endowment fund, out of which the necessary cost of such continued and systematic lines of investigation may be defrayed." In other words, the Society of Arts appeals to manufacturers, merchants, and others, of known wealth, to help it to raise a fund of at least £100,000 to enable the Society to carry on its work with increased advantage to the community. Surely no arguments are needed, after what we have said, to enforce this appeal. While large funds are solicited and bequeathed for the alleviation or the mitigation of evil, comparatively little has as yet been bestowed on measures coming within the scope of the objects of the Society of Arts, for the prevention of evil, by promoting the extension of existing fields of industry and the creation of new ones. We have little doubt that the Society will attain its object, as it richly deserves to do from its past antecedents.

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THE BLACKPOOL MARKET COMPETITION.

THE Blackpool Local Board recently determined to erect a new market and offices, at a cost of £7,000, and invited designs in open competition. Forty-seven sets were received, and acting on the advice of a professional arbiter, the Board awarded the first premium of thirty guineas to Messrs. W. & J. Hay, of Liverpool.

Some of the unsuccessful competitors, if the local press is to be believed, had friends in several members of the Board, and when these gentlemen found that the premiums had not been awarded in the direction of their wishes, they discovered that the idea of a new market was altogether an unnecessary one, and that, with a little alteration, the present building was quite sufficient for all purposes. The Board was accordingly induced to resolve that the Town Surveyor be instructed to carry out some alterations at the present market, and be paid in addition to his salary at the rate of 2½ per cent. on the cost of the work. They next resolved that the site next the fish market be covered with a glass roof, and the plans for which be obtained by a competition exclusively confined to local men. This time, it was determined the work should not pass out of the town. Six designs were received, and one was selected, by Messrs. Garlick, Park, & Sykes, at an estimate of £2,940. The whole of the six competitors could not, of course, be appointed, and a fresh squabble has arisen over the selection made.

With this second competition we have nothing to do; the question is, are the members of the Blackpool Local Board to be allowed to ignore the first? A correspondent of the local journal, who appears to be conversant with all the facts of the case, recommends Messrs. W. & J. Hay to bring an action against the Board for the full amount of their commission on the estimated outlay of £7,000. We trust some step may be taken to awaken the Board to a sense of its unwarrantable conduct in the matter. It would, however, be an interesting thing to inquire who is primarily responsible for the breach of faith. Town councillors, we know, are not always animated by the highest sense of honour. But architects are supposed to be governed by correct motives, and we hope that no impression of disappointment will prevent the local architects vindicating what is right.

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A RAMBLE IN MANCHESTER.

[FROM OUR OWN CORRESPONDENT.]

THE prevailing characteristics of the architecture of Manchester are monotony and dulness. Picturesqueness, variety, æsthetic adaptation of architectural forms to the marked peculiarities of the city and its atmosphere, are invariably disregarded. The huge warehouses and blocks of offices forming the commanding objects in the principal streets are mere repetitions of the primitive cotton-mill type of structure, more or less overlaid with surface ornament. Concealed roofs, an absence of chimney-shafts, unbroken parapets, a preponderance of strongly-marked horizontal lines in cornices and string-courses, and tier over tier of dingily-defined window-openings, are the leading features of almost all the large buildings. They are repeated as persistently as though they were the quintessence of fitness and beauty, whereas, of all architectural features, they are probably the least applicable to the streets and art conditions of Manchester. Horizontal lines and simple cubical buildings harmonise with a bright clear sky, or form an agreeable contrast with picturesque and rugged scenery. Manchester rarely has a bright clear sky, and is built upon a level and most unpicturesque site. Long rows and tiers of windows, to which the sunlight can give an endless diversity of sparkling lights, shade, and shadow, and to which an adventitious cheerfulness can be added by means of upholstery and domestic luxuries, are always pleasing objects. But such conditions are entirely absent in the hundreds upon hundreds of windows that begrime the Manchester warehouses. Upon them there is no sparkle, no brilliancy. Frequently the glass is deeply recessed, the window-frames are painted a dark colour, and it is very seldom that an ordinary light window-blind is seen to relieve the gloom of the glass and the density of the building. Dressings and shafts of polished granite, with carvings and incised work, are liberally introduced; but these, which for a time give variety to the mere surface of a façade, add little or nothing to the pictorial or scenic value of a building as a whole.

It is a delightful relief, after the monotony of Portland, Mozley, and the intermediate streets, to behold the freshness and vivacity of the architectural gem which Mr. Truefitt has constructed in a street off King-street for the banking house of Messrs. Brooks & Co. It is also a relief to see the artistic manner in which Mr. Salomons has, in two or three instances, pierced the dense atmosphere with conical angle-turrets; and carried his buildings up brightly against the dull sky by means of glass inserted in the lower slope of Mansard roofs. There are also a few examples of artistic brickwork scattered here and there, principally in the suburbs, that relieve the general monotony. At several villas in Broughton Park, Messrs. Maycock & Bell have produced successful works of this class, wherein the legitimate and simple treatment of bricks has been conscientiously kept in view. Messrs. Medland & Henry Taylor have constructed a Nonconformist Chapel in brickwork, on the Oxford-road, but these gentlemen have over laboured their work, falling into the common error of applying bricks in projections as they would moulded stone, whereby the inevitable results of coarseness and heaviness are obtained. Messrs. Pennington & Bridgen have constructed a block of shops and offices in Piccadilly, in a legitimate style of brickwork worthy of more general adoption. The lower story of this building, by the way, must not be included in the approbation bestowed upon the upper portion. The few existing examples of artistic brickwork cause one to regret that it is not introduced more generally. Mr. Witherington, for instance, had a fine opportunity for constructing his new Police-courts—a brick building—without stone dressings. All its main features might have been treated as effectively in brickwork as in masonry. Apparently, there exists in Manchester a prejudice against brick buildings without dressings. In Oxford-street, at new shop premises, Mr. T. T. Smith has introduced ornamental dressings for his brickwork of gaudily-painted cast iron! A most reprehensible practice prevails among the building society surveyors and speculative builders of recessing herring-bone strings and bands over window-heads within the thickness of 9in. external work. By this means a prettiness of appearance is obtained, with the absolute certainty of the admission of rain into the centre of the walls.

The general feeling of depression produced by the buildings in the business portions of the city is entirely dispelled by the costly residences to be met with in the suburban districts of the better class. These represent the taste and cheerfulness of Manchester society, while for interior fittings, convenience, elegance, and a thoroughly home aspect, they are not surpassed by any residences of the same class in the kingdom. A ramble among those numerous mansions and villas affords a more correct indication of the artistic tendencies of Manchester society than is to be found in all the huge architectural efforts in the central streets. The men of business have monopolised the city proper, to the exclusion, almost entirely, of the fairer portion of the community. Fashionable streets and shops are confined to a limited area quite incommensurate with the requirements and tastes of a wealthy population. A change, however, in this respect is now taking place. The old street called Deansgate is being increased, 490yds. in length, from its original width of about 25ft. to 60ft. This is being done at the expense of the Corporation. A fine opportunity is forthcoming for the construction of a leading street that will be a credit to the city, and an addition to the fashionable area. Two important blocks of buildings have been commenced on the new line of frontage, from the designs of Messrs. Corbett, Raby, & Swyer. The largest of the two, to be called Barton's Buildings, will comprise an arcade in three divisions, like the letter H on plan, covered with an ornamental iron-glazed roof, and two domes, 80ft. high. The frontage to Deansgate is 177ft., and the whole area to be covered is 2,094 square yards. There will be thirteen shops on the ground floor, with show and retiring rooms on the floor above. The second and third floors will form offices. The construction throughout will be fireproof. The design for the building presents to the new Deansgate-street a central portion five stories high, covered with an exposed roof; this is flanked on each side by towers 19ft. square, and 80ft. high. The extensions of the elevation to the right and left of the towers are four stories in height, with concealed roofs. The style will be Italian. The two lower stories will be constructed with cast iron, the upper portion with Darley Dale stone. The towers, dormers, and roof of the central portion, the chimney-shafts, the terminals upon the parapets, and the elegant domes will be welcome features in Manchester. Polished granite shafts and string-courses, carvings, ornamental iron spandrels over the entrances to the arcade, and an ornamental iron balcony, judiciously broken, extending the whole length of the building, will form the minor embellishments of a well-proportioned façade towards Deansgate. The works are proceeding rapidly. The basement, two stories in depth, has been completed by Mr. William Healey, of Salford, at a cost of over £4,000. The superstructure is being carried out by Mr. William Southern, of Salford, at a cost of about £40,000. The sub-contractors are Messrs. Macfarlane, of Glasgow, for the iron roofs and domes; Messrs. Measures Brothers, of London, for the fire-proof construction; Mr. Marshall, of Manchester, for the masonry; Mr. Mooney, of Manchester, for the carving; Mr. Stones, of Ulverston, for the revolving shutters; and Messrs. Jeffray, of Manchester, for the plumbing and glazing.

The other block in Deansgate, adjoining Barton's Buildings, is in course of construction by Messrs. Thomas Clay & Sons, contractors, of Manchester, under the direction of Messrs. Corbett, Raby, & Swyer. The architects have continued the main features of their larger building upon this. Shops and show-rooms upon the ground and first floors rise to a height of 30ft., as in the adjoining building, with an elevation to Deansgate, in cast iron. Corresponding in height with the adjacent towers, will be a central lofty octagonal tapering roof, surmounted by a turret and flag-staff. This building will contain two fashionable high-class shops, a series of offices, a restaurant, and a convenient hotel with twenty-four bedrooms. The cost will be about £12,000. These two buildings alone will stamp the character of the new street, by including it within the area of the fashionable promenade.

A number of buildings of considerable magnitude are also in progress. The Manchester and Salford Savings Bank is progressing under the direction of Mr. Salomons; a new insurance office has been commenced in Albert-square from the designs of Mr. Redmayne; and the public abattoirs are being constructed from the plans of Mr. Darbishire.

The great works in the hands of Mr. Waterhouse are rapidly progressing. The new Town Hall is approaching the roof line; Owen's College is roofed in, and the house property between it and the Oxford-road is being removed. Judging from its present appearance, there will be conflicting opinions both as regards the modification of style and the artistic treatment introduced by Mr. Waterhouse to meet the utilitarian requirements of the college.

In the suburb of West Gorton, a new church has been constructed by the Brethren of the Order of S. Francis of Asissi, from the designs of Mr. E. Welby Pugin. In style, it is a vigorous rendering of the best Gothic types. The principal front has three majestic buttresses boldly planted upon a gable end which rises to a height of over 100ft. The imposing effect of the front is intensified by the introduction at a great height from the ground, and in the centre of the gable, of a colossal crucifix in full relief. A central turret, with other terminals, are yet required to complete this elevation. The church is 184ft. in length, 72ft. in width, and 98ft. in height to the central ridge. The external walls are built with coloured bricks and stone dressings most effectively blended as to colour. The interior has the appearance of having been modified by another hand. Over the columns, dividing the nave into six bays, are a series of statues with plain canopies and corbels; above them, in the clerestory, are a series of attenuated red columns; all of which decorations look flimsy, patchy, and without constructional fitness. Another unsatisfactory feature of the interior is a series of red columns in the windows of the aisles, square on plan. Acoustically, the building is a great success. The whole of the work has been practically superintended, and the symbolical carvings designed, by the resident brethren of the adjoining monastery. The statues and carvings were executed by Messrs. Williams & Millson; the gas-fittings by Messrs. Hibbert & Co.; the stained glass is from the *atelier* of Messrs. Edmondson & Son; and the benches and furniture were supplied by Messrs. Sidebotham & Co.; all of Manchester. The last-named firm—Messrs. Sidebotham & Co.—has just completed a screen and pulpit in the Swedenborgian Church in Peter-street. It is a good specimen of their invariably excellent workmanship. The design has been carried out in polished oak, with panels of light gray imitation marble, supplied by the Marezzo Marble Company, Limited, of London.

A novelty in the construction of theatres has been successfully introduced at the Prince's Theatre in Manchester, by the lessee, Mr. Charles Calvert, and his architect, Mr. Darbishire. Space for additional rows of stalls has been obtained by forming a spacious orchestra under the footlights of the stage, wherein all the members of the band are placed, with the exception of the conductor, the leader, and the soloists. An ornamental open railing divides the orchestra from the stalls without materially obstructing the view of the other musical performers, or the sound of their instruments. The additional space obtained by this arrangement has been required in consequence of the immense success attending the annual production of Shakesperian plays by Mr. Calvert. The secret of this success is worth noting. Mr. Calvert ignores the traditions and conventionalities of the stage. To a high poetic conception of his task he brings all the accessorial aid which the architect, the archæologist, and the historian can supply. The play of "Henry the Fifth," which he is now presenting, is an attempt to realise the minutest details of the habits and usages of the people of the period. He quotes his authorities; explains the meaning of his pageantry; Mr. Darbishire writes him a short treatise on the heraldry displayed; his scene-painters, costumiers, and property-men employ their materials with realistic accuracy; and so, instead of a mere theatrical spectacle, he creates a basis wherefrom his characters acquire an air of reality, instinct with life and artistically truthful. Shakespeare at his theatre is interwoven with the prevailing phase of Mediæval associations; the Manchester public is presented with that new key to his conceptions; and welcomes him in "this age" as he will be welcomed in "all time," when he is intelligently represented.

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BABY CULTURE.

WHEN we see the Examination papers of the Institute, and hear from time to time the discussions which bear upon the duties and attainments of the architect of the nineteenth century, we must own to a certain feeling of awe for the ideal scientific artist-architect of the future, and this feeling is not unmixed with one of pity when we consider the severe course of study which must be undergone by those among our brethren of the next generation who aspire to the much coveted diploma of that day. We feel that as new sciences and new duties are constantly being added, the time is coming when it will be our duty to expostulate with those who add fresh burdens to the already overtasked architectural student. In fact, in the present state of things, it seems almost necessary to draw attention to the new sphere of architectural labour which the Metropolitan Board of Works would appear to unfold in the following advertisement:—

"INFANT LIFE PROTECTION ACT, 1872.—Notice to persons having charge of infants.—The Metropolitan Board of Works being the local authority for the Metropolis (except the City of London and its liberties) constituted by the "Act for the Better Protection of Infant Life," hereby give notice, that they have made certain regulations under that Act, and that persons requiring to be registered may now obtain forms of the certificate as to character and ability to maintain children which is to be produced pursuant to the statute. Application to be made to the Superintending Architect at the office of the Board, Spring-gardens.—By order, J. E. Wakefield, Acting Clerk of the Board. Office of the Metropolitan Board of Works, Spring-gardens, Nov. 1, 1872."

This is, indeed, something quite out of the ordinary course of professional work. We have heard of certificates "for payment on account," or "for extras," but not "certificates as to character and ability to maintain children," for which application has to be made "to the superintending architect." We should have thought some such officer as the superintending matron should have been charged with such duties. After a careful consideration of the above advertisement we have arrived at the following conclusion:—That it is, perhaps, intended that the architect should give his opinion as to the suitability of the baby farm for the reception of the said infants whose life is in future to be protected, but if this is to be the task of the superintending architect, why are the regulations spoken of in such a mysterious way? All the architect would appear to have to do in this case would be little more than to schedule the dilapidations of the dwelling, and perhaps prepare a list of the furniture; in this case he might, with advantage, be associated with a superintending upholsterer or decorator. We really think that some effort should be made to obtain an explanation of this curious manifesto, if only with the view of preparing a fresh clause for the scale of professional charges. Pending further information, we recommend the subject to the attention of the next Architectural Conference.

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BRIDGE ROADWAYS.—V.

IN our preceding articles the heavier descriptions of the roadways and footpaths of bridges have been sufficiently illustrated, and we shall now proceed to describe a few examples in which a lighter kind of superstructure has been adopted. It would be expected that a suspension-bridge is that type of structure which is peculiarly well adapted for receiving a light description of roadway and footpaths, and it will be found that, with one or two rare exceptions, such is the case. It is, however, only fair to state that opinions differ very much on this point. Some engineers maintain that under no circumstances whatever should a timber platform be used for a bridge, while others assert, with equal determination, that it is the description of superstructure most suitable for the purpose. On reviewing the pros and cons of the whole question, our own opinion is that the classic motto, "*In medio tutissimus ibis*," holds good in this instance. In other words, the views we have already expressed with regard to the matter are correct. They amount, in effect, to the statement that different descriptions of roadways and footpaths are suitable for different types of bridge construction, and that in this as in all similar cases any attempt to lay down one undeviating rule would be a failure. Independently of the particular kind of roadway that may be the best adapted for the bridge itself, there is also another consideration to be kept in view. It is the kind of roadway that is most suitable for the traffic passing over the bridge, and the relative advantages of the same description of superstructure with regard to both of these requirements are sometimes very dissimilar. Considering, however, what a very short distance, comparatively speaking, the length of a bridge is, the safest plan, in the event of any doubt in the matter, is to adapt the roadway to the character of the bridge, and make the traffic of secondary importance. Having described several examples of bridge roadways in which both street and road traffic are provided for, we shall now come "nearer home," and take a glance at some of the metropolitan bridges, and it will be seen that even in the same type of bridge a different character of superstructure is adopted.

In Fig. 1 is represented the cross section of one-half of the roadway of a bridge which is but too well known as one of the standing eyesores in the metropolis. It is that of Lambeth Bridge, which enjoys the unenviable distinction of being the ugliest bridge to be seen on the river Thames from its source to its *embouchement.* It has only one merit, that of economy—if it be considered a merit to save a few thousand pounds in the erection of a structure, in order to render it a disgrace instead of an ornament to the capital as it might have been. It has been well remarked, using a very common phrase, that it is "cheap and nasty." It has effectually ruined the Albert Embankment, in necessitating the footpath to be carried underneath it by a couple of ascending and descending ramps, so that pedestrians really "go down into the pit," and rise out of it again in walking along the embankment from Westminster to Vauxhall. Although *à propos* to the subject of the bridge, the absence, or rather the violation, of all æsthetical principles in its construction, has nothing to do with the character of the roadway, which we shall now proceed to investigate. Referring to Fig. 1, the main, or side, girders G, which are supported directly by the chains, are built up of plates and angle irons in the ordinary manner. They belong to the old box form of girder, a form that is now nearly obsolete. It was a good deal used in the early employment of wrought iron to the construction of girders. This fact was probably due to the idea that, owing to its particular shape, it was considerably stronger than any other form. This opinion has been since shown experimentally to be erroneous. If it be compared with a plate girder, containing the same amount of material, it will be a little the stronger of the two, but the slight increase of strength is not by any means sufficient to compensate for the other disadvantages it possesses. The principal of these are increased difficulty in rivetting together, and no facilities for future examination when once put together complete. In the instance under notice the box girder has internal dimensions of 2ft. 3in. by 1ft. 6in. It is just possible that a boy might contrive to get inside to do any painting that might be required, and examine the interior generally, but anything like a proper examination is out of the question. There is a legend prevalent in one of our large iron establishments, that a boy was sent inside one of these box girders while some repairs were going on and some extra plates being rivetted on, and that he was rivetted up inside, and it was not until many rivets had been "cut out," and the plates removed, that he was liberated.

The roadway in Fig. 1 is carried on the cross-girders C C, which are of the plate type familiar to all our readers. These cross-girders are rivetted to the lower flanges of the main girders G, and constitute a strong cross brace between them, and very materially add to the stability of the whole bridge. They are cambered so as to give the proper curve to the road shown by the thick line. The platform is composed of wrought-iron plates, rivetted to longitudinal and transverse wrought-iron beams, so that the roadway forms a horizontal girder of great strength to prevent lateral motion. The platform is suspended to the cable, not by vertical rods, but by rigid lattice sides rivetted to the longitudinal beams of the platform. The lattice sides are intended to prevent the longitudinal undulation which necessarily occurs in other suspension bridges supported only by vertical rods. It is further sought to check disturbance by attaching the cables to the standards, and not as hitherto done to a saddle allowed to move freely on rollers. The standards are constructed of wrought iron, and form an essential part of the design, acting in combination with the lattice sides to produce lateral rigidity. This is certainly an original combination. The roadway is formed of wooden sets laid upon concrete as shown in the cross section. It was originally intended to lay the road with macadamised granite, but the intention was not carried out. The footpaths are flagged with York landings. The state of the roadway and footpaths of this bridge is at present none of the best. Many of the "sets" are much damaged and worn, and in some places there are almost ruts in the surface of the road. The flagging of the footpaths, moreover, is of a very poor character, and very roughly and coarsely laid, and would not be tolerated in a structure of the kind over which there was much traffic. The traffic over Lambeth Bridge is not of any importance.

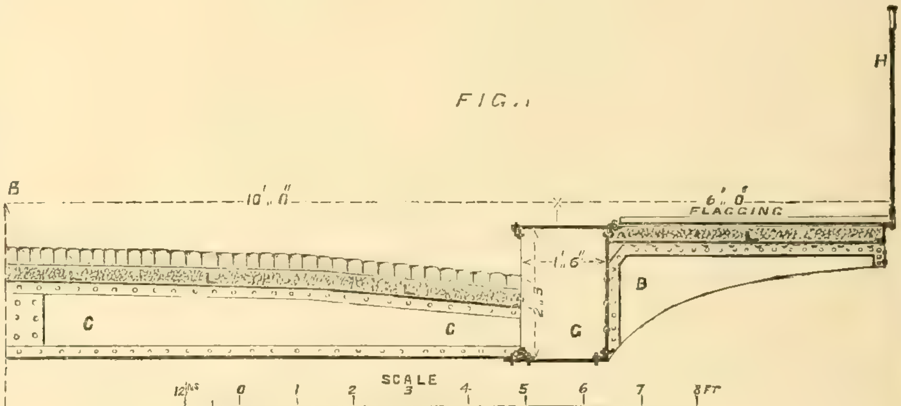
FIG. 1

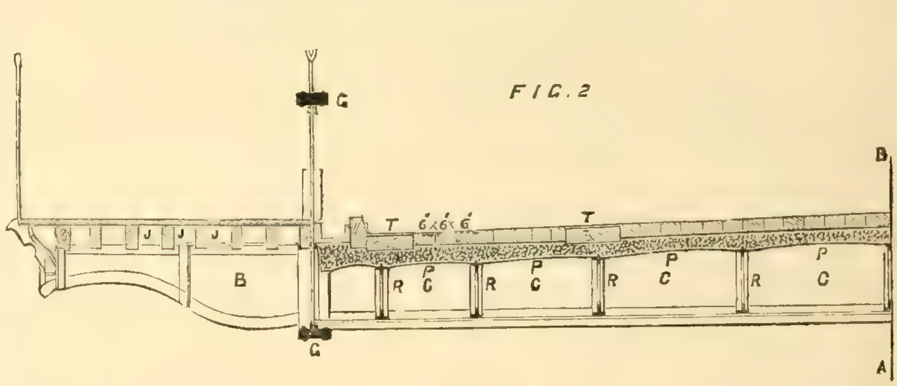
FIG. 2

A very different style of roadway is that laid over Chelsea suspension-bridge, which is represented in half-cross section in Fig. 2, the centre line being A B. Wood, we find, is very much made use of. In fact, with the exception of the light concrete filling over the arched wrought-iron plates, the whole of the roadway and footpaths are of wood. This description of superstructure has been objected to on the score of being liable to take fire, but the risk of it so doing is very small in a bridge confined to road traffic. It is well known that during the great fire at Chicago the wooden pavement was readily inflamed, and added greatly to the horrors of that frightful catastrophe. Railway bridges of timber have been known to be ignited by the platform, which was also of that material, catching fire from the hot ashes and cinders falling from the engine, but the danger becomes very remote in the instance of bridges devoted exclusively to the purposes of road street traffic. In the cross section in Fig. 1, the transverse or cross girders C which support the roadway are placed 8ft. apart from centre to centre immediately under the suspension rods, and bear upon the bottom flange of the longitudinal girder G. They are 31ft. 10in. in length, 2ft. 2¾in. depth at the centre, and 1ft. 11in. at the ends, where they are connected by a system of rivetting with cantilevers B, 7ft. long, which practically, form a continuation of them, and serve to support the overhanging footpaths. The sectional area of the top and bottom flanges is 10in., and the vertical rib is ¼in. thick, stiffened with tee-iron. The small roadway bearers between the transverse girders R are from 3ft. 3in. to 3ft. 10in. apart, 8ft. long, and vary in depth from 1ft. 5¾in. to 1ft. 9½in. to suit the cambered surface of the roadway.

The several girders that support the roadway thus form a series of rectangular cells, which are covered with arched plates of wrought iron P, stiffened with angle iron. The haunches of the plates are filled in with a light concrete composed of cork and bitumen, and previously to laying the bitumen concrete, the plates and girders were coated with asphalte.

The roadway is paved with oak blocks 6in. by 3in., by 4in., bedded in bitumen, and furnished with trams T of timber flush with the roadway, with wrought-iron strips bolted down on the top for durability. The preference was given to the cork and bitumen concrete as a bedding for the roadway blocks on account of lightness compared with ordinary concrete. Moreover, concrete in such a position, and in so thin a layer, is liable to crack, and become in time pulverised, and is then no better than loose gravel, which is liable to be deranged by passing traffic, and very soon wears into ruts and inequalities. The footpaths are paved in the same manner as the roadway, only the blocks are of smaller dimensions. This pavement rests on planking placed on joists J, running longitudinally, and resting on the cantilevers. The available breadth of the whole carriageway is 29ft., and footpaths 14ft. 4in. The principle of "decking," or covering the entire platform of a bridge with timber, will be carried out to its fullest extent in the superstructure of the new Albert Bridge, as will be seen in our next and concluding article on this subject. There can be no doubt that the interposition of a timber medium between the absolute moving load on a bridge and that structure itself is advantageous in a variety of ways. It certainly facilitates the haulage, and benefits the bridge by acting as a cushion against sudden shocks and vibrations.

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ARCHITECTURAL ASSOCIATION.

AT the usual fortnightly meeting of this Association, on Friday evening last, the President, Mr. J. Douglass Mathews in the chair, the following gentlemen were elected members of the Association, viz.:—Messrs. W. H. Norris, A. P. Wilson, H. Hopton, E. Sugden, Maurice B. Adams (of Brighton), W. A. Brown, W. P. Hicks, H. S. Wrench, A. P. Taylor, A. H. Newman, W. Schubert, and J. Hunt.

Mr. JOHNSON then read an essay for which he had been awarded the prize annually offered by the Association for the best essay. The subject of this prize essay was

ON THE SPECIAL CHARACTERISTICS OF MEDIÆVAL GOTHIC ARCHITECTURE PERTAINING TO PARTICULAR DISTRICTS OF THE UNITED KINGDOM.

The essayist attempted to show that all the individualities of Gothic architecture existing in different parts of England were to be traced to foreign influence, individual taste, or the nature of the building materials obtainable, although the more important peculiarities were probably due to the exigencies arising from the last-mentioned cause; and that however important those arising from foreign influence or individual taste might have been, they were always subservient to the necessities imposed by those exigencies, and, in most cases, to the predominance of the forms generally prevalent at the time. The essay was of extreme length, and we can give but a short abstract of it. The author commenced by saying that in the various countries, and at the different times, in which the art of architecture had been practised in its integrity, although its general character had been much the same at the same period wherever its votaries have held sway, it has always been modified in different localities, according to the conditions under which the architects worked. By "individual taste" the author did not refer to those whims and fancies which were now or generally spoken of as "matters of taste," for in ages when architectural forms were traditional, and when architects no more thought of working in a foreign style than of placing their buildings upside down, their individual tastes, instead of being exercised in deciding on the style, had no wider scope than that of determining the outline and disposition of the various ornaments to be employed in their buildings, and in this they were to a great degree governed by the form generally prevalent at the time, and by the character of the materials which nature had placed within their reach. The earliest form of the Mediæval Gothic work of this country which could in any sense be called architecture seemed to be the Norman, and that only in ecclesiastical edifices, their castles being merely the crude specimens of a still more crude system of engineering. The name "Norman," however, as applied to the whole of the round-arched style, must be accepted with considerable reservation, as many of its features, and those not the least essential, were scarcely to be met with in Normandy. Although the followers of William the Conqueror were principally Norman, there were in their ranks a great many adventurers from all parts of Europe, and these generally brought masons with them from their native countries, so that although the general character of all buildings erected in England between the years 1066—1190 was decidedly Norman, there was found in many of them a great deal that, while absent, or at least rare in Normandy, was very largely to be met with in Burgundy, Lorraine, the Netherlands, the valley of the Rhine, and even in the North of Italy. The most purely Norman buildings erected in England in the eleventh century were S. Paul's Cathedral, London, and the cathedrals at Norwich (barring the tower), Rochester, Winchester, and Ely (barring the western portion). Mr. Johnson entered at some length into the peculiarities of these and other buildings, with the view to show that such peculiarities were all more or less referable to foreign influence. With regard to the influence of the nature of materials on the architecture of the Norman period, he noticed that the absence of any kind of building stone, good or bad, in the counties to the north and east of London, gave rise to the practice of building with rubble, composed principally of old Roman bricks, as at S. Albans (Verulam) and Colchester (Camalodunum). The round towers of Norfolk and Suffolk were also attributed to the want of good stone for the quoins. With the single exception of the Cathedral at Kirkwall, in the Orkneys, Norman architecture did not seem to have penetrated into Scotland farther north than the Grampians, and in the southern districts, it was only to be known by its ornaments, as the round arch was retained, in some instances, even till the fourteenth century. In Ireland, which, until the year 1176, was governed by native rulers, the architecture of the Normans could scarcely be said to have ever gained a footing. Almost all the excellencies of Norman art, however, were merely the prototypes of the more beautiful works of succeeding ages, and the manner in which, during the Transitional period, the good parts of the old style were modified and worked in with, and its barbarisms rejected from, the new, did more credit to the otherwise barbarous age in which it was done than our own works did to the far more enlightened period in which we lived. According to the peculiarities displayed by the Norman, in different parts of the country, so, to a certain extent, were the idiosyncrasies noticeable in the Early English style. From this period, however, the existence of several distinct schools of architecture in these islands might be traced. At Canterbury, in 1174, by William of Sens; at Winchester, in 1189, by Bishop Godfrey de Lucy; at Lincoln, in 1186, by Geoffry de Noiers; and at Fountains, in 1204, by Abbot John de Eber, four distinct phases of Early English art were evolved, and from these four fountainheads of design, all guilds of masons from the English Channel to the Firth of Forth, from the German Ocean to the Irish Sea, took their cue; while in Scotland and Ireland, although English forms were at different times prevalent, according to the political relations then existing, the architectural monuments were of so varied and foreign a character that it was impossible to trace them to one starting point, much less to one originator. As in the preceding ages, foreign influence still displayed itself in the southern cathedrals of Canterbury and Rochester. After the "glorious choir of Conrad" at Canterbury had been almost destroyed by fire in 1174, the monks employed William of Sens to rebuild it. On his death in 1178, however, an English architect named William succeeded to the charge of the works. Under the direction of the Englishman, although the general outline of the building remained the same, the details of the style underwent considerable modification. But about the middle of this century a large influx of foreigners took place from Normandy, Brittany, Anjou, and even Guienne and Provence, and among others, Boniface, a Savoyard prelate, who was in 1258 made Archbishop of Canterbury. Very little Early English work of this date existed in the Cathedral, but Westminster Abbey and the churches of S. Mary Overy, Southwark, and Stone in Kent, left no lack of evidence as to its general character. The prevalence of moulded work in the capitals, &c., of the first and second of these is their principal English feature, and is probably owing to the influence which envy of their rivals at Salisbury had upon their designers. In the churches of Kent and Surrey, led, probably, by the beautiful little church at Stone, bar tracery was first used, the consideration of which brought the author to the Decorated period, first, however, noticing a separate school existing at Wells, which shortly afterwards became engrafted on that of Godfrey de Lucy. During the episcopate of Bishop Jocelyn (1171—91) the nave and transepts of Wells Cathedral were built. The north porch showed many peculiarities; indeed, were it not for its pointed arch, it might almost be called Norman work. On the final removal of the bishopric of Old Sarum to Salisbury, however, it was determined to erect a church entirely in the new style, and in the year 1220, under Bishop Richard le Poore, this was commenced, and continued uninterruptedly until its completion in 1258. The capitals were moulded throughout, with the exception of those to the vaulting shafts. The emulation caused by the commencement of Salisbury Cathedral, which was felt even at Westminster, led, probably, to the rebuilding of the choir of Worcester Cathedral, which was commenced in 1224. This seemed to have been the work of a local school of masons, as very few of the peculiarities noticeable at Salisbury were to be met with in it, and it was not until Bishop Gray's time that a fusion with the Salisbury school seemed to have been effected. The connection between this school and that at Salisbury, though not to be traced in any part of this cathedral, might be noticed in the transept of York Cathedral. The few stone buildings erected in Wales at this period, such as Valle Crucis Abbey, in Denbighshire, must be attributed to offshoots from this school of masons. Under the patronage of Hugh of Grenoble, Bishop of Lincoln, an architect named Geoffry de Noiers commenced, in the choir of Lincoln Cathedral (A.D. 1186), a style of Early English differing considerably from those of his contemporaries although as truly English as that of Godfrey de Lucy. The abundance of good building stone in the counties of Northampton and Lincoln, with parts of those adjoining, must always have been an impulse towards the erection of large and elegant churches, and of those erected in the thirteenth century, the fine arcaded towers at Stamford, West Walton, Felmarsham, and Whaplode; the lofty spires at Etton, Threckingham, Warmington, and Raunds; and the arcaded interiors at West Walton and Cherry Hinton, showed that this impulse was not lost on the inhabitants of a district which was probably at that time one of the richest in England. The next step, however, towards the development of this school of architecture was taken by Hugh de Norwold, Bishop of Ely, under whose guidance the presbytery of that cathedral was rebuilt (A.D. 1235—52). The triforium showed a more decided advance towards the adoption of tracery than was noticeable in any previous works. For the founding of a great architectural school in Yorkshire we are probably indebted to John de Eber, Abbot of Fountains, who in 1204 commenced the erection of the nave of his abbey. In Scotland, during the thirteenth century, the style of architecture which had been introduced in the cathedrals at Dunkeld and Aberdeen, and which without doubt, received ever and anon a fresh impulse by means of offshoots from the North of England abbeys, became to a slight extent naturalised, and if the buildings erected at this period could, with any degree of probability, be attributed to Scotch masons, they must also have the credit of several very excellent distinctive features noticeable in them. The first decidedly Gothic design in Scotland is the Cathedral at S. Andrews (said to have been commenced A.D. 1210). The gradual growth of tracery (which, if it ever took place, had been quite lost sight of in the North of England) might be traced with tolerable facility in the Cathedrals of Glasgow and Dunblane. In Ireland, although the Early Pointed style gained a somewhat better footing than that of the Normans had, the few specimens that remained were very rude. In the south-eastern counties, which until this period had been always more or less under foreign influence, architectural forms now began to became Anglicised. The influence of the want of building materials in the county of Essex led to the extensive use of wood as a building material, and to the early part of the fourteenth century the first examples worthy of mention may be referred. The want of good building stone probably necessitated the construction in wood of the lantern surmounting the "octagon" at Ely (1328—42) and the impulse which this deficiency gave toward the study of the application of woodwork was already beginning to display itself in many beautiful roofs and screens. In the Cathedral gateway at Norwich, and the beautiful priory church at Walsingham, Norfolk (both erected about A.D. 1340), another way of meeting this exigency displayed itself in the use of cut flints, and the carefulness with which these were fitted into the stonework, and the surface decoration worked out by these means had a very fine effect. The choir of Ely Cathedral is a specimen of the next advance made in this district. The introduction of the Perpendicular style in this part of the island, which showed itself, in the first instance, in the erection of many fine churches, such as that of Walpole S. Peter in Norfolk, was not effected till the beginning of the fifteenth century, and the first great works executed in the new style—viz., those at Norwich Cathedral, were not commenced till the year 1446. The introduction of tracery in the North of England Abbeys was effected by Simon of Warwick, Abbot of S. Mary's, York (1259—99), in rebuilding the abbey church, and from this date the architects of this part of the island lost almost all the individuality of their style. The introduction of Perpendicular forms in the presbytery and choir of York Cathedral (1361—1410) was the next step taken by the Northern architects. As in the preceding period, the architecture to the early part of the Decorated era in Scotland bore a considerable resemblance to the contemporary designs in the North of England, and the beautiful choir of Elgin Cathedral (which was commenced shortly after the destruction of the greater part of the older building by fire in the year 1270, was a specimen of the characteristic tenacity with which Scotch masons retained forms which had been superseded elsewhere. From the date of the erection of this building, it may be assumed that the introduction of tracery, which first appeared in the nave of Dunblane Cathedral, did not take place much before the commencement of the fourteenth century. Soon after the introduction of this all-pervading feature, however, the influence of English forms began sensibly to diminish, and from the latter half of the fourteenth century to the general abandonment of Gothic forms, the presence of French masons in many parts of Scotland was easily noticeable. The south transept of Melrose Abbey (*c.* 1350) is almost the last building which displays any English influence. But another influence was brought to bear upon Scotch architecture in the importation, by William de S. Clair (1446), of masons from the North of Spain; and apart from the chapel at Roslyn, every detail of which might be traced back to Burgos or Oviedo, their influence is apparent in the many barrel-vaulted churches to be found in this part of Scotland, a conspicuous example being the nave of Melrose Abbey, the groined roof of which is surmounted by a stone barrel vault. The architecture of Ireland in the fourteenth and fifteenth centuries was of a character but slightly in advance of that of the thirteenth, the Abbey Church of the Holy Cross, near Cashel, being almost the only example worthy of mention. The piers were all square, although a second order was applied to the underside of the arches, and carried on corbels at the springing. The towers were, generally speaking, oblong on plan, the earlier ones having probably been covered with the saddle-backed roof so common in the North of France. In the fifteenth century, and until the close of the Gothic era, a few of the forms connected in an English mind with the Perpendicular style were occasionally to be met with in Ireland, but their decoration had no affinity whatever with anything to be found in England. With the general adoption of Perpendicular forms which (introduced at Gloucester about A.D. 1340) had, on the opening of the fifteenth century, overspread the whole kingdom, almost all the individuality of the hitherto self-existent schools of architecture in this island was lost. Apart from a few and comparatively unimportant peculiarities, the Perpendicular style was the same all over the kingdom, and this fact, combined with that of its being peculiar to this country, rendered it, of all English Gothic styles, the only one that could consistently be called a national style.

Mr. CLARKSON, in proposing a vote of thanks to Mr. Johnson for his essay, observed that the views enunciated by the reader were well worthy of attention, supplemented, if possible, by a careful comparison of examples of the same date in different parts of the country. He was disposed to attach considerable importance to the idea that local schools of design, so to speak, existed, exerting great influence over the whole of their districts. Indeed, the groups of churches which many members of the Association had visited under the guidance of Mr. Sharpe supported that view, and also the very obvious inference that the abundance of good building stone in any particular district had great influence on the development of the architecture of that district.

Mr. PAICE having seconded the proposition,

The CHAIRMAN, in putting it to the meeting, remarked that the subject which Mr. Johnson had brought forward and the points he had adduced were to some extent new, and were very interesting and well worthy of study. There was no question but that we had to thank the Normans very much, if not wholly, for the style which we had at the present time. As to the duration of foreign influence, there was no doubt that so long as our countrymen were under the dominion of the Normans, they had very little indeed of an individual style, although he believed there were always indications of the ability of the English to become architects. With regard to individual taste, no doubt each architect had his own ideas, but other men than the designers carried out the details, and there must have been a wonderful system of architectural education pervading the country, because the age of buildings could be told by the contour of the mouldings. All this pointed to there having been some very complete system of architectural intercommunication existing amongst the builders of the Middle Ages.

Mr. JOHNSON having said a few words in reply, the meeting terminated.

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute held on Monday evening last, the President, Mr. T. H. Wyatt, in the chair, the following members were elected:—As Fellows: Edward D. Drury, of Bucklersbury; Robert Lamb, of Darlington; and Matthew Thompson, of Newcastle-on-Tyne. As Associates: B. Binyon, of Ipswich; H. Hall, of 7, Westminster Chambers, Victoria-street, S.W.; T. E. Mundy, of 12, Buckingham-street, Strand; G. T. Redmayne, of Manchester; H. Stone, of 30, John-street, Bedford-row; and C. C. Tompson, of Cairo, Egypt.

The PRESIDENT announced that at the next meeting of the Institute the members would be asked to elect M. Charles Questel, of Paris, as an Honorary and Corresponding Member, and, by request, Mr. Phené Spiers gave some account of the works of M. Questel. M. Questel is a Member of the Institute of France, architect to the Palace at Versailles, architect of the Church of S. Paul and the restoration of the Amphitheatre at Nismes, of the Prefecture of Grenoble, and the Maison d'Aliene´s in Paris, &c.

Mr. EDWARD I'ANSON, Fellow, then read a paper

ON THE VALUATION OF HOUSE PROPERTY IN LONDON.

Mr. I'Anson first proceeded to point out, as he had done in a previous paper,* how remarkably the City is divided into district markets, such as the money market, the colonial market, and the fruit market. Special localities are adapted to, or at all events are practically used for, special purposes, and property differs considerably in value within very narrow limits. There can be no intuitive knowledge as to whether land is worth £1 or 1s. a foot, and a knowledge of its value can only be obtained in two ways. One method is to inquire what does the land in the several localities let for? As Old London—the London as rebuilt after the Great Fire of 1666 (for there are but few and isolated houses of an earlier period)—is fast wearing out, and a large portion of the ground upon which it is built belongs to charities and other corporate bodies, the letting of the land is not unfrequently the subject of open competition, and as the bidding is open to every one it is fair to assume that the utmost value is usually obtained, and lettings made in this manner afford a good criterion of the letting value. This is one means of ascertaining the value, but it is at least prudent not to depend upon a single instance, as the land may have been let too cheaply (for this is a common occurrence), or a neighbouring owner may have paid an excessive price to secure some special personal advantage. It is desirable, therefore, in estimating the letting value, to secure as many illustrations as are obtainable, and to consider and weigh the evidence thus produced. Again, the value of land varies with time; at one time becoming stagnant, or apparently retrograding in value. Within the last few years, when what appeared a maximum had been reached, prior to the memorable day in November, 1866, when the great discount house of Overend, Gurney, & Co. stopped payment, city land could hardly be disposed of at any price. There can be no doubt that those speculators who had invested in city lands or buildings were great losers; but the value of land had not diminished, but was only temporarily depressed on the sudden cessation of demand for it, and at the present moment city property is realising the full value it had attained prior to the crisis of 1866. Assuming, however, that the valuer is in possession of all the requisite facts as regards recent dealings with any particular plot of ground, it still requires considerable judgment to foretell what may be the realisable selling or actual value; and it must always be, to a certain extent, speculative, and dependent upon the skill with which the architect adapts his building to the wants of the locality. There is, however, another method of determining the value of land, and that is by ascertaining the letting value of the building put upon it when erected, and after deducting a certain amount for interest on the outlay to repay the builder, and allowing for all outgoings in the shape of rent, taxes, insurance, service, maintenance and repairs, management, loss of rent from portions of the building unlet (called "empties"), the residue capitalised will represent the value of the land. This method of calculation also requires a knowledge of many local circumstances, the rates and taxes for example, varying in different districts, as does especially the chance of "empties." In the lowest class of property, that which is let weekly, it is hardly safe to reckon upon a less deduction than one-half of the gross rent to arrive at the nett rent. This is rather an extreme case, but the rate of deduction for outgoings does actually vary between one-half and one-fifth. To illustrate this mode of calculation, suppose that a building realises

By various lettings a gross rent of		£1,500
Say the building cost	£10,000	
Assuming the builder's profit to be 7 per cent. that gives	700	
And deducting for rates, taxes, insurances, &c., one fifth	300	
The total deduction would be	£1,000	1,000
Leaving as the annual letting value of the ground		£500

This is merely an illustration; when the buildings are very speculative and slightly built, so as not to be durable, 7 per cent. interest would not pay the builder, because to a large extent speculative buildings are erected with borrowed capital, and as money is seldom obtainable for less than 5 per cent. the builder has not only to provide a sufficient margin for a profit for himself, but to set aside a yearly sum as a sinking fund to accumulate to repay the borrowed capital. Again, the outgoings depend very much upon the taxation in the locality. This latter method of calculation has been to a great extent adopted in endeavouring to prove the value of land taken compulsorily for public improvements; and if the rentals which might hereafter be obtained in new neighbourhoods could be foretold with actual certainty, then after making due allowance for "empties" and management, and a proper interest to the builder for his investing capital, the nett result would be shown in the most legitimate manner, and that would be the value of the ground. The future rent must, however, still be to a great extent matter of opinion; it is also speculative as to what would be a fair profit for the builder, how long that profit will be deferred, and even what would be the actual cost of the building. It is pretty generally agreed that in valuing freehold house property, after finding the actual nett value, that is, the value of rental at which it would let without premium for a term of 21 years to a tenant paying a nett rent, without deduction for land-tax, insurance, or any other charges as imposts, property tax excepted, that such annual value should be capitalised upon the 5 per cent. table, which is equal to 20 years' purchase. Thus a house or other building producing a nett rental to the owner of £100 per annum is worth 20 years' purchase, or £2,000. This is a generally admitted preliminary or starting point, but only a starting point, for if the building is old and likely to require rebuilding, then the value of the land must be found apart from the house, and each valued separately. Thus, assuming the land and building together to be, as before, of the annual value of £100, and the annual value of the land or ground rent is one-fourth of the whole rent, or £25, and that the building is so far decayed as to necessitate its rebuilding in 21 years, it is evident that the calculation must be different.

	£	s.
You have first the annual value for 21 years at £100, and this is worth, upon the 5 per cent. table, 12·82 years' purchase, or	1,282	0
To this must be added the value of the ground rent of £25 at the expiration of 21 years. Valuing this upon the 4 per cent. table (the table usually adopted) the value of the land will be £25 × 25 years' purchase, or £625. But the realisation of the sum is deferred 21 years, and it must be discounted by that number of years, and discounting also upon the 4 per cent. table, you multiply by 438	273	15
Which gives a total of	1,555	15

There is another way of stating the question, and probably the more correct way, which produces a slightly different, but still a different and more favourable result.

	£	s.
Taking the value of the land first, in fee or in perpetuity, we shall have £25 × 25 years, or as we have before found	625	0
Then we have the assumed annual value for 21 years of £100 per annum; but as the ground rent has already during that period been accounted for, we must deduct £25 from £100, which leaves a nett £75. This, for 21 years, at the 5 per cent. table, is worth, as before found, 12 82 years, or	961	8
Making a total of	1,586	8

This method gives a little more than the first method of calculation, and evidently arises from capitalising the ground, that in the first calculation for the first 21 years at the 5 per cent. instead of the 4 per cent. table. These calculations give rise to more questions than one. Upon the first mode, the principal question that presents itself is, What deduction must be made to arrive at a nett rental, the rate of deduction, as already explained, varying considerably? On the second and third valuations, two questions at least arise, which must materially affect the result arrived at. The first question is as to the number of years' purchase at which the ground rent should be capitalised. The rule is twenty-five years' purchase, at the 4 per cent. table. The author, however, has constantly claimed and contended for more, because ground rents are, in his opinion, the best-secured and safest description of security, and one that is constantly increasing in value, assuming that the land is let for a term of years terminable at no very remote period, such as a lease for from sixty to ninety-nine years, in which case there is always a certain value attaching to the reversion at the end of the term. The first question then is, Upon what table should the ground rent be capitalised? The author's experience is that twenty-five years' purchase is the minimum, and probably twenty-eight years' purchase is the maximum, but even this must not be considered a fixed rule, for there are exceptions. The value of City ground rents has for some years declined, but still the author considers a really good ground rent to be worth twenty-seven and a half years' purchase. There are, however, many considerations affecting this value: for example, the proportion of the ground rent to the gross or rack rent. As it very frequently occurs that the ground rent is as much as one-half of the rack rent, it is very clear that in such a case the reversion is of comparatively small value compared to what it would be were the rack rent one-sixth or one-seventh, as it is in less valuable localities. It sometimes happens that ground rents are sold the title to which, although a good holding title, is not absolutely perfect, and as ground rents are frequently bought as investments by trustees, the Court of Chancery looks so narrowly at the title that it depreciates the value of the ground rents. It not unfrequently happens that a value may be obtained for property far beyond its intrinsic or marketable value to anybody but the purchaser. The ability to obtain a frontage upon a street, river, or canal, or the substitution of a frontage of a superior nature to that hitherto enjoyed, or similar advantages, all confer additional value. There is yet another question arising out of the second method of computation of the value of land let upon lease for a term, and that is upon what table should you discount the deferred value—*i.e.*, the value at the expiration of the term? and this is a problem not easy of solution. Assuming, for argument's sake, that the deferred value is absolutely a fixed quantity (say £1,000), payable at the end of fifty years, and that you are to receive such a sum of money as will realise, by careful investment of the interest, a capital sum of £1,000 at the end of the fifty years, very much depends upon the rate of interest which it is assumed can be obtained for the money. If you assume you can obtain 3 per cent., and consequently discount upon the 3 per cent. table, you should have in present money £228

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* Read before the Institution of Surveyors.

Upon the 3½ per cent table 179
,, 4 ,, ... 140
,, 4½ ,, ... 110
,, 5 ,, ... 87

The author proceeded to show that it was but a poor bargain to part with a reversionary interest at a price to pay 5 per cent., and that it is excessively difficult to find a means of accumulating the interest on the present money in order to secure the full value of the reversion. After referring to the often existing "dormant value" in property, Mr. I'Anson concluded a very elaborate paper by dealing with the question of the rate of profit to be allowed to the builder. Evidently, he said, the rate will vary according to the skill with which the building is designed and erected, and the perfect suitability of the building for the locality in which it is placed. Obviously ill-suited buildings would realise a less rent or less profit than one that is well suited to the locality, assuming both to be built on land of the same estimated value. Any return beyond the current rate of interest for money, which is practically 5 per cent., is a profit to the builder. Sometimes the profit is added to the ground rent, which creates an improved ground rent, and is saleable at a greater number of years' purchase than a rack rent.

A brief discussion ensued, in which Messrs. Edward Smith, Jennings, Roberts, Charles Fowler, J. W. Penfold, and C. F. Hayward took part, and the thanks of the meeting having been given to Mr. I'Anson for his paper, the proceedings terminated with the announcement that the next meeting of the Institute will be held on the 16th inst., when a paper will be read by Mr. Heathcote, Associate, "On the Old Halls in the Neighbourhood of Manchester."

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CHIPS.

The first meeting of the Civil and Mechanical Engineers' Society will take place this (Friday) evening at 7.30 p.m., when the President will read his opening address.

The church at Kirby Knowle is in course of restoration, from designs by Mr. G. F. Jones, architect, of York.

A new church was consecrated on Monday week, at New Hincksey, Oxon. Mr. E. G. Bruton is the architect.

The services in connection with the opening of the new Wesleyan chapel, erected in Moseley-road, Birmingham, were held on Wednesday week. The cost of the building is about £6,000. Land for large school-rooms and a lecture room has been purchased. The architects are Messrs. Loxton Brothers, Wednesbury.

Sheepscombe Church, near Painswick, which has been undergoing repair, was reopened on Friday last, by the Bishop of Bath and Wells.

"MANSARD" ROOFS AND THE BOSTON FIRE.

BY far the larger part of the buildings destroyed in the late fire at Boston, says a correspondent of the *Standard*, after rising five or six stories into the air, were surmounted by tall sloping roofs, miscalled after Mansard, the great French architect, whose name is thus unjustly consigned to lasting dishonour in America. These roofs were wholly of timber, thinly sheathed with slate or zinc, and, consequently, were nothing more nor less than great tinder-boxes, which blazed up with inconceivable rapidity as the flames from the other side of the street were blown over against them. At this great height, often 100ft. above the ground, the streams from the fire-engines could do little execution, and thus, in a short time, whole acres of warehouses were on fire at the top, and it seemed impossible to prescribe bounds to the area of devastation. Here, again, a desperate but sure expedient might have availed against so widespread a ruin, in blowing up adjoining buildings with gunpowder. This was, indeed, attempted, but it was so unskilfully done that it rather extended than diminished the total amount of disaster. But the Mansard roof, so called, was not the only cause of destruction to the exposed buildings. In the majority of cases the internal supports were of iron, many of the warehouses were externally of iron, and this metal, expanding with the intense heating, sometimes shrivelling up like a scroll, and sometimes even becoming fused, the whole fabric fell in a great heap, while its contents were thrown out, filling the street with a mass of blazing material. In the United States certain architectural novelties and innovations have a run like a new style of dress or a new pattern of vehicle. In former days, not very long ago, the Grecian architecture was the fashion, and houses of all conceivable kinds, churches, colleges, gaols, private dwellings, were erected after the manner of the Athenian temples. Parthenons of pine and Erechtheums of lath and plaster arose all over the land, the village school house had its portico and the rich man's country seat boasted its peristyle. To the Grecian succeeded the Gothic Pointed manner, in which all new structures were built, from a pork-packing house to a penitentiary. This flourished for a time and passed away. At the present moment the reigning madness in architecture is the Mansard roof, which is indiscriminately applied to houses of all shapes and patterns, large and small, without the least regard to the purposes for which they are intended. Many of these roofs are themselves of three stories, and rise 40ft. or 50ft. above the eaves or cornice, and as in ninety-nine cases in a hundred they are made of wood, with the flimsiest covering, they offer to a fire the greatest possible opportunity for working mischief. I have before me a large folio of fine photographs representing the architectural glories of reconstructed Chicago, and incredible as it may seem, every costly building of the newly-risen quarter—whether bank, hotel, chamber of commerce, city court house, or mercantile establishment—has for its crown or head-dress this soaring Mansard roof, which a future conflagration may decorate in five minutes with plumes of flames.

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THE GAS COMPANIES AND THE STRIKE.

THE universal cry in the metropolis during the past week has been for "more light," and when the gas companies and their *employés* consent once more to pay a little attention to the wants of the public the cry will, it may be hoped, be continued in a sense not altogether agreeable to those who have failed to discharge the duties laid upon them by the monopoly they have enjoyed. If the men have seized what they deemed the opportune moment for enforcing their demands on their employers, the gas companies have continuously disregarded the convenience and comfort of the public, and have persistently combated all efforts to bring about an improvement in the conditions of our gas supply. As a matter of course, in the opinion of gas proprietors and managers, and as a rule in the opinion of the newspapers, the men who have struck are altogether in the wrong. In fact, if educated opinion may be relied on, the men, whether they be gas stokers, policemen, letter-carriers, or coal miners, cannot be in the right. But it is a remarkable thing that, in the face of universal discouragement, the men do combine, and their combinations deepen and strengthen daily. But we should be entering beyond our province to discuss the complex question of labour and capital. We prefer saying a word or two on new modes of gas-making and gas-lighting.

Mr. Robert Porter, managing director of the Gas Generator Company (Limited), writes to us with reference to the strike that it may be some comfort to the public to know that the London gas companies have now under consideration a mechanical arrangement by means of which the dependence of the gas supply of London on manual labour may for the future be, to a great extent, avoided, and steam power and machinery substituted, with great improvement in the quality of gas, for the rough and primitive process which up to this time has prevailed in the retort houses of our numerous gas-works. To those managers of gas-works who are unacquainted with the new system referred to, he offers every information, and an inspection of the machinery in operation.

The *Preston Chronicle* says:—"Much astonishment, mingled with keen interest, was evoked in Preston when the announcement was made by us a few months back that a new mode of lighting gas had been hit upon, by which all the street lamps in the town could be lighted instantaneously, while the same effect could be produced from a given point—if the communication were correct—however great the distance of ignition might be. A full description of this mode of lighting, of the place of its invention, of the progress it has already made in other countries, of the accuracy and rapidity of its action, and of the economy of its use, was given in our columns, after a most successful experiment had been made in Preston. At that time we stated that 'the apparatus constituting the invention looks like a moderately-sized globular ink-stand of glass, surmounted by a tube of the same material, with a metallic top; and by screwing off the burner it can be very easily attached to any lamp, chandelier pipe, or ordinary gas jet. The base or globular portion is filled with a deep red-coloured liquid—a simple chemical mixture with no combustible properties, almost without smell, and so cheap that threepennyworth of it will serve one lamp for twelve months. Over this liquid, and within the glass tube, there is a plate of zinc, with a piece of graphite or gas coal, and between these and a thin coiled platinum wire, fixed over the cap of the general vessel, into which a gas-burner is inserted, galvanic communication is obtained.' We further remarked that ignition was effected in the following way:—'A pipe to be screwed to that up which the ordinary gas supply flows runs through the base of the vessel to about the centre of the surmounting tube; pressure brought to bear upon the gas in this pipe causes, by small collateral openings, a simultaneous depression upon the chemical solution which occupies a lower level in two side tubes; the gas occupies the vacuum caused by the displaced liquid, and then ascends to a chamber in connection with the burner, while the displaced liquid is pressed into two side tubes, effecting contact with the zinc and graphite, generating galvanic activity, which is communicated to the platinum wire, and exciting the catalytic power of the wire, which, when opposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition.' The mechanism is of the simplest construction, and can be applied to any kind or number of gas pipes, either remote from or proximate to the works, to street as well as to office or shop lamps, and the light can be extinguished as quick as it can be ignited. The invention has been patented for the United Kingdom by Mr. J. Billington Booth, of Preston. On Wednesday and Thursday afternoons, that gentleman gave a special invitation to the Mayor and aldermen of Preston to inspect the new gas-lighting apparatus, in action at the Glover-street gas-works. The invitation was well responded to, for, besides the aldermen, several other gentlemen took advantage of the opportunity of seeing solved the strange problem of 'a lamp lighting itself at any distance.' The apparatus was fixed in one of the rooms in connection with the gas-works, and here the different experiments were made and explained. The first trial was on a number of burners running along the room, from which, on the mere working of a small regulator and the heat produced on the platinum wire, the jets were instantly and simultaneously lighted. With the same success several gas-burners in different offices were lighted and extinguished. Afterwards a large chandelier, containing about fifty lights, was illuminated as if by magic, the effect being beautiful and surprising. On the intimation of Mr. Booth, two lamps fitted up in the yard of the gas-works were ordered to be lighted, and no sooner had the word of command been given than a flame was seen to be burning in each. This light—produced without any one going near the lamps—was as easily and quickly extinguished as reproduced. Several lamps, fixed to nearly the top of the ceiling, a height of 30ft., were ignited with the same facility—now all at once, now one after the other, just as the wish was expressed. The experiments were continued for about an hour and a half, and there was not a single hitch during the whole time, nor anything that could have any other effect than that of convincing every one present that if the new method were introduced generally a public boon would certainly be conferred."

VILLA AT BROUGH, EAST YORKSHIRE.

THE material used is concrete, worked with Drake's patent wrought-iron apparatus. The proportions of gravel and concrete for the foundations (which are in some parts 17ft. deep) are 9 of gravel and broken stone to 1 of Portland cement; for the portion above the ground line, 7 to 1. The outer surface of the walls will be floated with a coat of cement, and enriched with a few small flat mouldings run in the same material; in the bay windows the panels are filled with a simple impressed pattern, made with a metal die. The front doorway in the tower is of Ancaster stone, with a slight amount of carving, and the chimneys and the tower are coped with stone; the steps and copings are of Bradford stone; with these exceptions, there is no stonework in the building. The entrance hall and conservatory are laid with tiles; the staircase is of oak and pitch pine, with tall and massive carved newels. From all the windows beautiful views of the Humber and the surrounding neighbourhood are obtained, and from the tower an immense tract of country is visible. The cost of the concrete and stone work is £826, making the price of walling per cubic yard 14s. 8d. The cost of the floating coat of cement on the outside, with mouldings, &c., is about £140. The gravel and broken stone are obtained within about 200 yards of the site; the cement is made by Messrs. Earle; the contractor is Mr. P. Rippon, and the architect is Mr. J. King James, all of Hull.

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THE COLLEGE, COBHAM, KENT.

NEAR Gravesend is the quaint village of Cobham, and close to it is Cobham Hall, the seat of Lord Darnley. One of the "lions" of the place is the Leather Bottle Inn, where, fictitiously, Pickwick and his friends, Snodgrass, Tupman, and Winkle, were made to regale themselves. But the spot of most interest to minds of an architectural or antiquarian bent is the old College adjoining the church. (See illustration.) The College was founded and endowed by John de Cobham, the last of the surname of that family, in the year 1362, "for a master and chaplins to pray for the souls of him, his ancestors and successors." It is quadrangular in form, having a hall and dormitories. The hall has a screen across the entrance, and is raised at one end after the fashion of that period. The roof is framed of oak, and is interesting as a specimen of fourteenth century carpentry. Part of the east wall, overgrown with ivy, and a large fireplace of the kitchen or refectory, still remain at the south-east angle. Between the north side of what is termed the New College and the church are the ruins of part of the north cloister; the doorway from it into the church is still visible, though stopped up. Through this door the masters and brethren proceeded daily to their stalls, to celebrate mass for the souls of the founder and his noble family, whose gravestones and monumental brasses paved a great part of the chancel of the church. The College was suppressed by Henry VIII., but it was founded anew on a reformed plan by Sir William Brooke (Lord Cobham) in 1597. Twenty poor persons and their families, elected by the adjacent parishes, are maintained in this college by Sir William Brooke's endowment; the revenue belonging to the charity arising from lands in the neighbouring parishes of Shorne and Chalk. R. A. F.

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BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

AT a general meeting of the supporters of this Institution, held at the office, 27, Farringdon-street, on the 26th ult., Mr. Thos. F. Cooke in the chair, an election of one pensioner on the funds was held. Considerable interest was evinced on behalf of the two candidates, one being up for the second time, and bringing 177 votes forward from the last election, and the other being the widow of a member of the Committee and one of the most energetic promoters of the Institution. The latter was successful, having balloted just sixty votes more than her opponent. Mr. Arthur Cates drew the attention of the meeting to the remarkable fact that Mrs. Jeferys being entitled to sixty votes on account of the subscriptions paid by her husband, had been elected by exactly that number, thereby showing the benefit to be derived by builders' clerks becoming subscribers. Messrs. Arthur Cates, Matthew Hall, and Thomas Stirling were the scrutineers. Mr. Alfred R. Smith suggested an improvement in the form of ballot paper, which was generally approved, and the matter referred for consideration by him and the secretary; and to be brought forward in a complete shape at a future meeting. The usual votes of thanks to the scrutineers and the chairman closed a most successful meeting.

ARCHITECTURAL MUSEUM.

Objects of the Museum.

THE Royal Architectural Museum was founded in the year 1851, in Canon Row, Westminster, as the nucleus of a National Museum of Architectural Art, and subsequently for several years formed part of the collection exhibited at the South Kensington Museum. The intention to which its founders and managers have steadily adhered is to supply that great and increasing want, felt by the public, and by architects, artists, and art-workmen, of means to refer to and study the architecture of past ages, and in combination with those arts which have their origin in or are dependent on architecture itself. Its direct practical object is to improve and perfect the art-workmanship of the present time, and to afford art-workmen opportunities of studying casts or copies of those works the originals of which neither their time nor their means will allow them to visit.

Accordingly, a large and increasing collection of casts and actual specimens has been already formed from the finest Mediæval examples, English and foreign, of complete architectural works, arranged as far as possible in the order of their dates; and of details, comprehending figures, animals, foliage, mouldings, encaustic tiles, mural paintings, roof ornaments, rubbings of sepulchral brasses, stained glass, impressions from seals and other objects. Schools of art not Gothic are also represented, though not so fully or systematically. A special collection of marble reliefs from the ruins of one of the ancient capitals of India, situated in the great desert of Rajpootana, of the date of about 1100 A.D., is due to the generosity of Sir Bartle Frere, G.C.S.I., K.C.B. To casts and specimens are added, as opportunities offer, photographs, drawings, and engravings of architectural works, and models of buildings.

Donations or loans of specimens, engravings, photographs, books, &c., will be most serviceable in enriching the collection, especially books for the library of reference for students and art-workmen.

Work of the Museum.

Courses of lectures by architects, artists, and amateurs, are delivered during the sessions in the Museum. And it need hardly be added that the friends of the Institution are solicited to aid in the delivery of such lectures, which are addressed especially to art-workmen.

Prizes for the most meritorious specimens of stone and wood carving, metal work, glass and decorative painting, modelling, drawing, &c., are offered as funds will allow with the view to encourage the art-workmen of the day and train them to think for themselves.

As a means of extending the usefulness of the Museum, honorary local secretaries are being appointed in the more important towns in the kingdom.

Regulations for Members, &c.

1. Members subscribing one guinea and upwards per annum, students subscribing 10s. per annum, and art-workmen 5s. per annum, to be admitted to the Museum on every day of the week, excepting Saturday and Sunday, from 10 till 4 o'clock, and on Saturdays from 10 till 6.30. Subscribers to be entitled to one copy of each edition of the catalogue of the Museum, with free admission to the lectures and meetings, and to study at all times in the Museum.
2. Subscribers of one guinea per annum to have the privilege of introducing, daily, by order, one visitor, or workman employed by them, for purposes of study, &c., and to be entitled to an additional card for lectures. Subscribers of two guineas and upwards per annum to be entitled to introduce more than one visitor or workman daily, and to have extra cards for lectures.
3. Subscriptions to become due on the 1st of January in each year. Notice of discontinuance of any subscription to be given on or before the 1st of October in the year preceding.
4. Life memberships may be compounded for by a donation of ten guineas, with all the privileges of subscribers of one guinea per annum.
5. Admission to non-subscribers 6d. Catalogues to be charged 6d. each to non-subscribers.
6. The Museum to be closed during August and September for the purpose of arrangement, &c.
7. The casts may be drawn from, but are not to be moulded without the special sanction of the committee, and then only by the authorised moulder to the Museum.
8. The property of the Museum under no circumstances to be removed from the premises.

Joseph Clarke, Hon. Sec.

13, Stratford Place, W.

CHICAGO CITY HALL COMPETITION.

THE County of Cook, and the City of Chicago, being about to erect a Court House and City Hall in said city, in which all the accommodation required for the business of every department of said county and city is to be provided, have determined to invite architects generally to send in designs in competition. The designs must include the principal elevations, which must be prepared in either Indian ink or sepia, without the introduction of any other colour, and also complete plans and sections of each floor.

All drawings must be made to a scale of eight (8) feet to an inch, on sheets of plain paper, and mounted without frames or borders.

The plans of the building must show the relative position of the offices assigned to the several departments, and the size of each room must be clearly marked thereon in feet and inches. Entrances will be on the four sides of the building. The main or principal floor will be elevated so as to admit of a thoroughly lighted basement underneath. Each design must have a device or motto marked on each drawing, and be accompanied by a sealed letter, giving the name of the author, which will be opened after the final award is made only for the purpose of ascertaining the names of the successful architects, and for the return of the unsuccessful drawings to their authors. The following premiums are offered:—For the best design, 5,000.00 dols.; second best design, 2,000.00 dols.; third best design, 1,000.00 dols.

Each competitor will give the cubical contents of his building, and an estimate of the cost of the same complete. The whole building must be made, as far as practicable, fireproof.

Sealed drawings will be received at the office of the Board of Public Works, corner of Adams and La Salle-street, Chicago, Ill., U.S., until the 15th day of March, A.D. 1873, at which time and place they will be opened by the Building Committees of the County Commissioners and Common Council, and the Board of Public Works.

The size of the square on which the building is to be erected is 378ft. north and south, by 320ft. east and west, but no portion of the building proper will come nearer than twenty (20) feet of the street lines.

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COMPETITIONS.

Antwerp.—Designs are invited for a new hospital at Antwerp. Three premiums, viz., 3,000fr., 2,000fr., and 1,000fr. are offered. The drawings must be sent in before the 1st of May, 1873. A pamphlet containing a plan of the site and the various conditions of the competition has been forwarded to the Royal Institute of British Architects, and can be inspected in the library.

Stockton Exchange Buildings.—In July last the directors of the Stockton Exchange Company publicly advertised for designs, but eventually the competition was limited to local architects. About eight sets of drawings were submitted, from which three were chosen, bearing respectively the mottoes, "Nota Bene," "Art and Commerce," and "Practice." In consequence of lack of funds none of the designs could be carried out, and the authors thereof were invited to prepare other plans in competition to suit a reduced site. Messrs. Alexander & Henman and Mr. C. J. Adams responded to the call, and the result is that Messrs. Alexander & Henman, of Stockton and Middlesbro', have been appointed to carry out the buildings, while a premium of £50 has been awarded to Mr. C. J. Adams. The selected design comprises an Exchange Hall, which can also be used for public meetings and entertainments, and capable of comfortably seating 1,700 persons, retiring rooms and cloak rooms being provided; twenty-two business offices, and a club with reading, billiard, letter-writing, smoking and coffee rooms, kitchen, &c. The site is a long and somewhat narrow one, with an entrance to the High-street of only 14ft. According to the original scheme the frontage was to have been about 68ft., and consequently allowed of a much more imposing façade to the High-street. The cost of the buildings is to be £9,000, and it is expected that they will be commenced forthwith.

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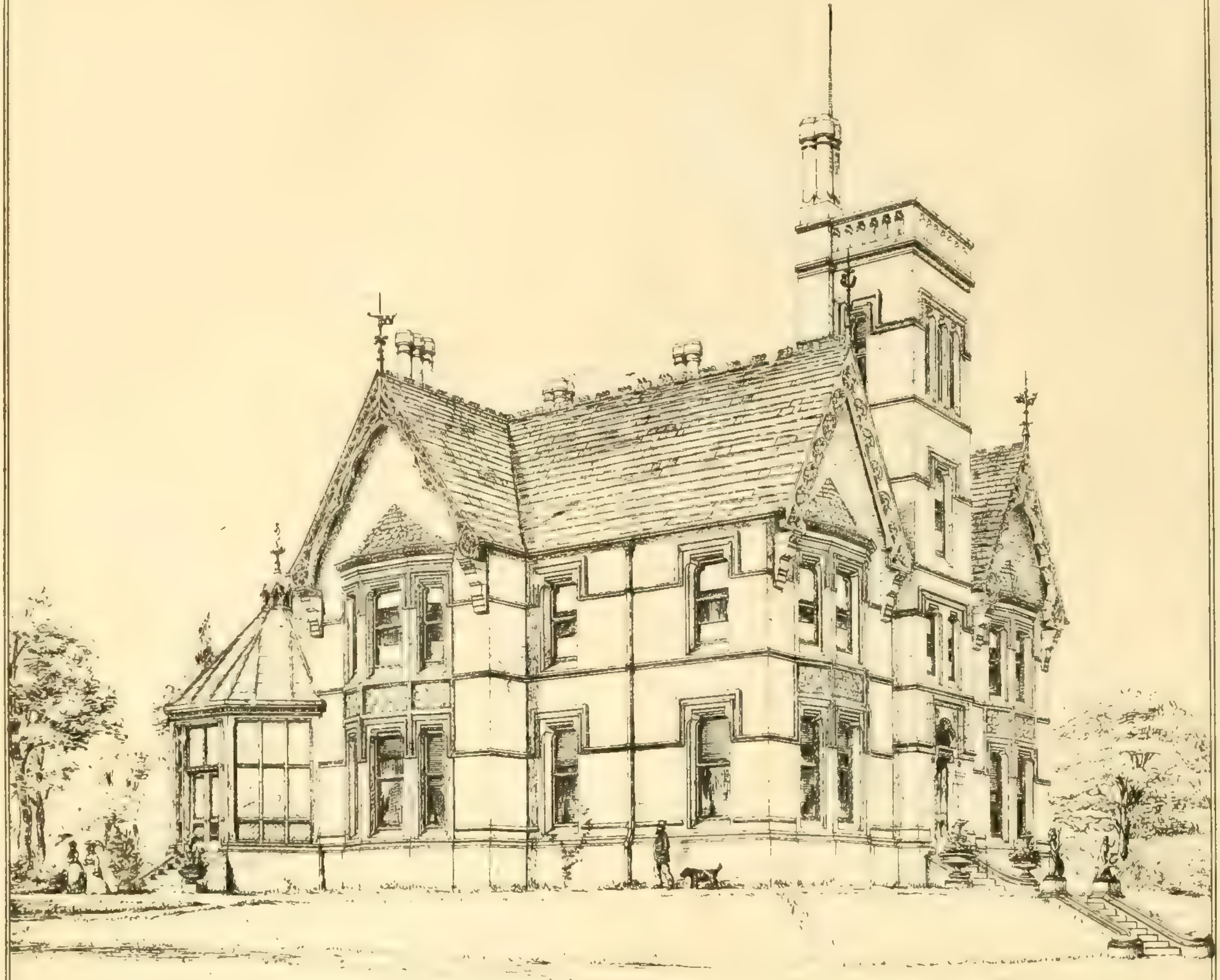
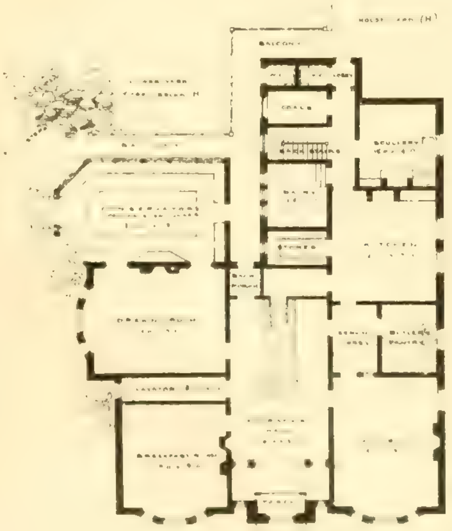
The Saddlers' Company have taken up, in common with some other of the corporate guilds, the question of technical education, and have expressed their intention of offering premiums for the best pattern for a military saddle.

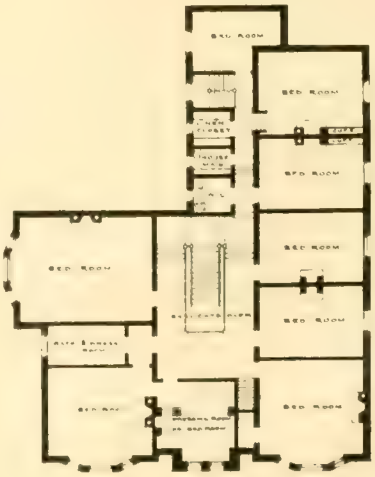
Mr. K. D. Hodgson, M.P., has given the £400 needed to make up £7,000, the raising of which, by the close of 1872, was made the condition upon which three sums of £1,000 each would be subscribed towards the completion of the new nave of Bristol Cathedral.



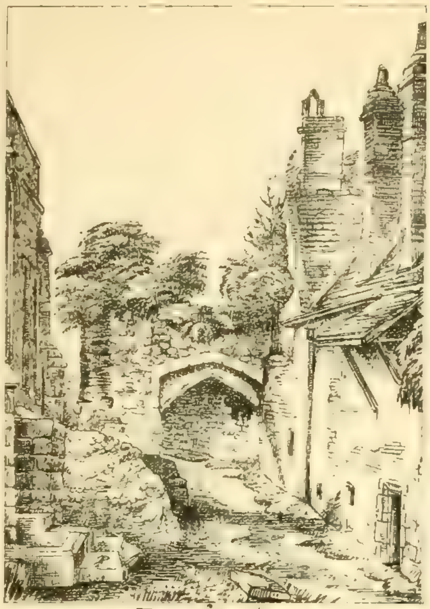
South-West View of a Villa at Brough, Yorkshire. J. King James, Architect, Hull.



GROUND PLAN



CHAMBER PLAN

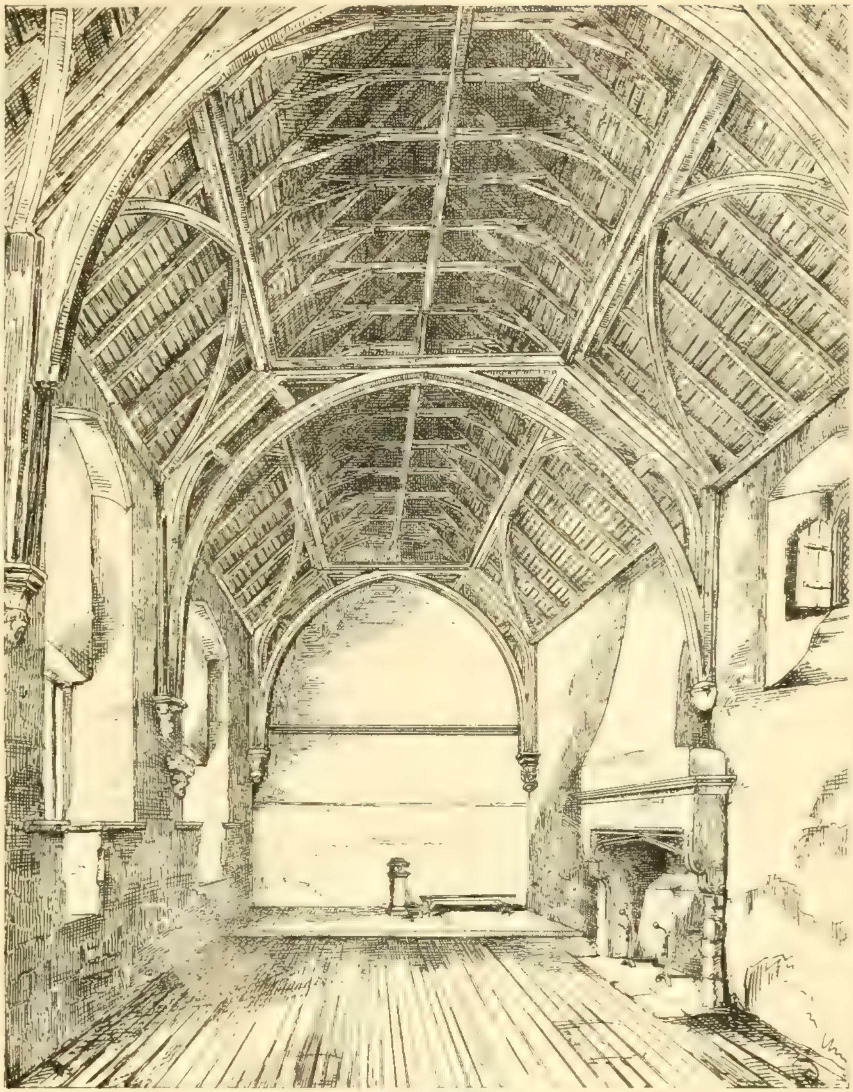


The Cloister

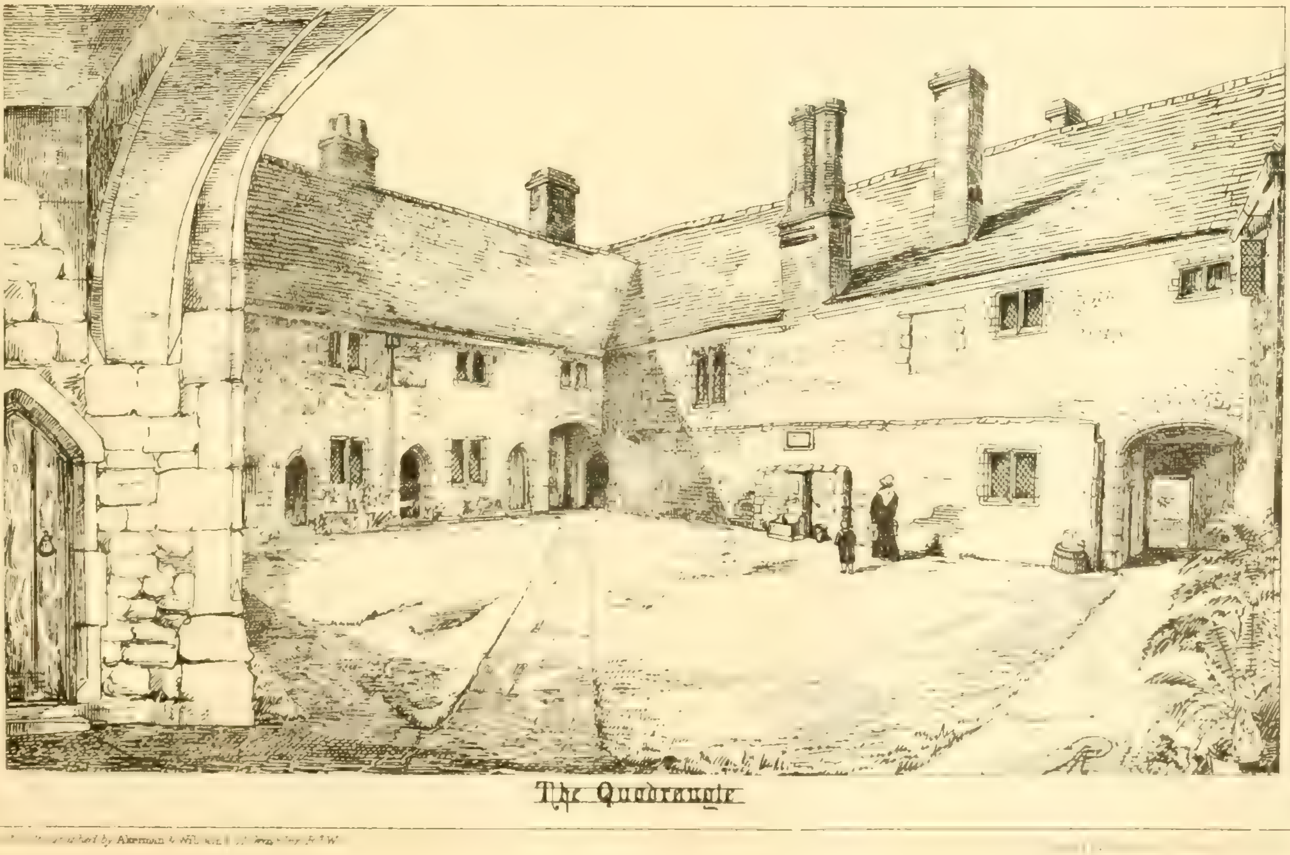
THE COLLEGE

COBHAM · KENT

Sketched by R. A. Fraser



The Hall



The Quadrangle

[illegible] by Akerman & Wilson [illegible]

"BUILDING NEWS" SCHOOL PLANNING COMPETITION.

THE time for sending in the designs for this competition expired on Saturday, the 30th of November. The following are the mottoes of the designs which have been received:—"Trefoil," "Light," "Anti-Birchbroom," "Labore est Orare," "R. R. R.," "Spero," "K.," "Labor Omnia Vincit," "What will be, will be," "Non Compos," "Spectemur Agendo," "H. C.," "Conatur," "Inception," "The Brilliant Star," "Educate, Liberate," "Two Heads are Better than One," "Nunquam Exspes," "Lux Lux," "Fides," "Qua Vere Verum," "An Advanced Infant," "Vivo in Spe," "Points," "School for Scandal," "Utility," "This it is and Nothing More," "Excelsior," "Honoris Causa," "My Motto," "Dum spiro spero," "Junius," "Valeat quantum valere potest," "Diogenes," "Concentrate," "At a Venture," "Valeat quantum valere potest" (No. 2), "Lux," "Absque labor nihil," "Thorough," "Simplicity," "Robur," "Star of the West," "Invicta," "Ad Valorem," "Spes," Compasses and T Square in Circle, "Spero" (No. 2), "Scotia," "Let me Reflect," "Fortis," "Freondsbœrig," "Pasce agnos meos," Black Star, "Hawthornden," "Numa," "Dum spiro spero" (No. 2), "We Live to Learn," "Labore est Orare" (No. 2), "Schule Laddie," "Ausus Sum," "Tempus Fugit," "S. Andrew," "Set Square," Triangle in Circle, "Set Square" (No. 2), "Pro Patria," "A. B. C.," "Tempora Mutantur," "R. R. R." (No. 2), "Elia," and "Jacques."

Two others came to hand, but being too late, were returned: one with the motto "Nineteenth Century," and the other, which came in a case almost big enough to carry a good-sized boat, was returned unopened, as the sender forgot to pay the carriage. We don't know the motto, but it might be "Love's Labour Lost." "A. B. C." also forgot to pay the carriage—one shilling—which, perhaps, he will be kind enough to send us at his earliest convenience. Most of the drawings came to hand folded on rollers, the most portable and certainly the cheapest way of sending them. Several drawings stretched on frames came in formidable cases, which must have taxed, in no small degree, the physical powers of the carriers. Three or four others came to hand folded so neatly and carefully (one of them scented) as if they were sent by lovers to lovers as birth-day presents. "Elia" and "Jacques" have, by colouring portions of their drawings, put themselves out of court.

And now a word on these Building News competitions. They are unquestionably extensively appreciated. Some time since, when a small premium was offered for a "heading" for the Building News, with Professor Donaldson as umpire, no less than 140 competitors entered the field. Upwards of 80 appeared in the list for the "Building News Sketch Book" prizes, and now dozens of others are asking another Sketch Book Competition. More than 100 sent in drawings for the "Building News House Planning Competition," and now more than 70 others have sent in designs for the School Planning Competition. In each instance, save one—the "heading" competition—the suggestion came from subscribers. In fact, we have left the competitions pretty much in the hands of correspondents and competitors. It is worthy of remark that no advertisement or notification of any kind of these competitions has appeared anywhere beyond a simple announcement in our own columns; and another fact worth remembering is that the competitors have differed as much as the competitions themselves. We mean that the competitors for the "heading" were, as a rule, different persons from those who competed for the "Sketch Book," and so with the house planning competition; and, as the competitors hail from all parts of the United Kingdom, it is evident that the Building News is extensively read and appreciated. As these competitive efforts have, with so little labour, taken such deep root, we think they are worthy of systematic encouragement. We therefore intend to organise in the Building News office a kind of competition department. In so doing we are only imitating the example of all our principal architectural societies. We should be glad now, as heretofore, to receive suggestions on the next best subject on which a competition shall be vited.

ON WARMING AND VENTILATING HOUSES.

LAST night Mr. J. P. Seddon read a paper before the National Health Society on Warming and Ventilating Houses. After some introductory remarks on the importance of the subject, and the necessity of economising coals for the benefit of all, Mr. Seddon said: It is asserted by some, and it is quite possible correctly so, that a house may be treated as a whole with regard to its warming and ventilating, and that the temperature of its interior may be kept equable and under perfect control. I venture to think, however, that such a system is more suitable to an asylum, where all the inmates are themselves under control as well, than for private families, the tastes of the members of which are as various as this climate is changeable. It is doubtful whether the heated interiors in America are conducive to health, although the cold season there being both more regular and severe, such an arrangement is more easy of application.* Again, the most skilful contrivances will occasionally fail, and then the discomfort will be as general as the opposite condition was intended to have been made. While, however, the different apartments in a house are, in my opinion, best treated separately, and as occasion may require, it is certainly desirable that more often than at present, and particularly in large houses, there should be some means of temperately warming, in inclement weather, the air in halls and corridors. This should be done, not only with the view of preventing sudden chills to persons passing from one heated room to another, but also for the sake of avoiding cold draughts thence entering the rooms when their doors are open. The bedrooms also would, from the same source, become filled with moderately-warmed air, which is in general all that is needed both for the comfort and health of their occupants. A house is a collection of apartments of which sometimes one portion only, sometimes another, or the whole, may be in use. In one room, for instance, invalids may need special warmth, which would be a nuisance to the healthy frequenters of others. Elaborate general systems of treatment, which need trained and constant supervision, such as cannot be continuously calculated upon in ordinary households, are therefore hardly applicable to them; and a certain amount of independence in the several parts of a house seems preferable, for the purpose of localising accidental nuisances or derangements of any part of the system. It is at any rate to such a condition of things that upon the present occasion I intend to confine my remarks. The usual appliances for warming houses, setting aside comprehensive systems, resolve themselves into open grates, close stoves, and, under special conditions, gas apparatus and pipes for hot air or water for warming halls and passages. For the whole of these certain general rules may be laid down:—(1) More cannot be got out of any one of them than is put into it. This is an axiom which, truism as it appears, is necessary should be impressed upon the public mind, which is apt to assume that engineering skill can multiply the heating power of fuel indefinitely. Thus materials like fireclay, which are absorbent of heat and useful to prevent its escape, and retain it till needed, must abstract it first from the fuel before it can dispense it. (2) There are but 100 degrees of percentage. This simple fact should be kept in mind in considering methods of saving fuel, the inventors of which would otherwise persuade one that reference to coal merchants is a work almost of supererogation. (3) Some proportion of the heat generated must be expended in maintaining a draught in the flue which is to carry off the products of combustion. This is by no means unprofitably lost since it promotes ventilation as well. (4) To minimise this proportion of escaping heat to as nearly as possible what is just necessary, and to take toll from it during its passage, as by warming the air which is to replace that abstracted by the flue, is the principal direction which efforts to economise fuel should take. (5) The products of combustion, being noxious, must be wholly removed, unless they can be chemically transformed. It is as barbarous to allow the fumes from gas to invade rooms as it is to let the door be the sole outlet for peat smoke in an Irish cabin, or as it was to provide only louvres in the roofs of the halls of our forefathers for the smoke of their wood fires. The evil may be disguised, but the poison is the more insidious from being comparatively unfelt. The lungs of the living animals, as the leather of dead ones on the book shelves, become corroded alike by its pernicious influence. (6) Warming and ventilation are so intimately connected that, although the latter is not my special subject upon this occasion, it is necessary that it should be kept in mind throughout while treating of the former. In fact, infusing heated air is a more economical and pleasanter mode of warming houses than direct radiation, and it is only by their capability of combining the two methods that open fires can maintain ascendancy over stoves, and it is only by uniting proper ventilation with stoves that they ought to be tolerated. Lastly, all appliances should be simple and as self-acting as possible. This is essential for those intended for the use of the poor, whose treatment of them is of the roughest, and who neither need nor understand anything complicated. If there be a damper to be drawn, or a handle to be turned by them, neither will be drawn or turned except occasionally the wrong way, and if there be any cover or part that is loose, it is safe to be lost. At the risk, therefore, of some waste their scanty fuel must be consumed in the most primitive manner possible. With somewhat less force the same caution may be given to those who design apparatus for the upper classes. Everything even for them should be as self-acting as possible, for though individuals may for a time take a fancy to an ingenious arrangement that requires personal adjustment, they tire of it in time; servants in their succession are not to be drilled into its use, and the thing is soon left to itself, and failure is the inevitable result. To proceed to the several appliances themselves. In the race to attain *economy* it must be acknowledged at the outset that close stoves completely distance open grates, and that they in their turn are as far ahead of all gas-apparatus, as at present invented; and yet each have some advantages as well as disadvantages peculiar to themselves, to which it is worth giving some consideration. In stoves the heat from fuel can be almost wholly extracted and utilised, and even the little that escapes with the gaseous products of combustion is heavily taxed when its ultimate exit is by the few insignificant pipes, or diminutive chimney-stacks, which alone are suffered to peep above the roofs of houses on the Continent. English ideas of comfort will not, however, permit of the general introduction of the stove system into this country, and it is hardly to be desired that it should, unless great improvement be grafted upon that in vogue abroad, in which stuffiness is ever an accompaniment of warmth. Our British privilege, however, of being able to poke the fire, although purchased dearly by its concomitant dust and the labour it entails upon servants, is not likely soon to be relinquished, and the luxury of an open fire is a fact which no theory can demolish. Still, the grates in common use savour of barbarism, and much can and should be done to gain further refinement, economy, and immunity from nuisance. There is no need, for instance, that our roofs should be disfigured by the ugly and even comical flue terminals which Dickens satirised in one of his latest Christmas publications. We ought not to be subject to vexatious down-draughts in windy weather, nor to chimneys that smoke unless a door or window be open. Our drawing-rooms should not be invaded by sooty chimney-sweepers, and all ought not to have to scramble for a place near the fire in a room to be warm, nor when there to have to rotate like a smoke-jack to prevent being frozen on one side while we are scorched on the other. Such evils are to be obviated by simple means, and yet ninety-nine out of every hundred Englishmen submit to them supinely, if not patiently. Whole streets, occupied by men of means, have their skyline fringed with demon-like excrescences which tell a sure tale of internal discomfort. Such was the case with that in which my own residence is situated. When I took my house upon lease, though it had been well built by an eminent architect for his own use, yet, in common with all its neighbours, it displayed a grim array of tall-boys and tortuous contrivances as chimney terminals. All these I swept away at once, without inquiry, feeling that whatever might be needed, they certainly could not be. I then introduced an air-pipe to each fireplace through the floors, and, as I expected, found no smoky chimneys to complain of, though my neighbours still grumble at theirs, as I do of their futile and unsightly expedients to remedy them. So much depends upon the proper construction of fireplaces and their flues, without which no appliance in the shape of a grate can have fair play, that I shall in the first place describe the points to be attended to in the erection of these portions of a building, and in palliating evils in those which already exist. The first essential to ensure a good draught is that the flue should be sufficiently rarified. For this purpose it is desirable that it should not be in an outer wall; but if it be necessarily so, the enclosing wall should be thick (at least 9in. between the flue and the outer air), or else it should be protected by a double casing with intermediate hollow space. Materials which absorb damp should be avoided for the construction, as they tend to the evaporation and loss of the heat generated, and the interior of the flue should be well pargetted to further prevent the suction of external cold by the up-draught within. Another important point is that the flue be not too large, or currents of cold air descending will interfere with the ascending heated air. In old buildings flues are found of large size, as 18in. by 12in., with wide throats, funnel-shaped, diminishing upwards. But the fuel used in them was wood, and abundant, and men were more hardy, and minded not the roaring of wind in the chimney, or cowered over the embers within the vast embrasure of the fireplace, which formed an inner room of itself. There are those who would revive these large flues on the ground that no cowls decorate their terminals. If, however, we are to recur to the practice of our ancestors, we might as well revert to that of a still earlier age, when the stately hall of Penshurst had its fire upon a hearth in the centre, and the graceful wreaths of smoke thence found exit by the lantern in the roof. We must needs then have the same goodly logs as fuel, and a supply which will enable us to afford the blaze that alone would suffice to rarify a cavern. The ordinary coal-fires of our apartments do not need a larger flue than a pipe of 9in. in diameter. Mr. Richardson, in his work, states that the houses built by Cubitt in Belgravia have flues 9in. by 9in. only, while others erected later have them 14in. by 9in., and that these are distinguishable outside by the absence or presence of objectionable cowls respectively. Kitchen flues must be larger in proportion to their fires, or better perhaps doubled—a practice for which old precedents may be found, and which seems calculated to avoid down-draughts. For the avoidance of that particular nuisance, however, special provision should be made in every flue. This may be done by an enlarged space wherein the force of gusts of wind may expend themselves upon, as it were, a cushion of air. If the first pipe above the chimney-mantel be a 9-in. pipe, let the next be a 15-in. one, and the flue above continued with 9-in. ones. A somewhat similar arrangement has been proposed by Mr. Boyd for brick flues. He discontinues the vertical flue a few feet above the mantel with an enlarged space or pocket, and carries an inclined one from the fireplace into this on one side, and the down-draught thus meeting resistance at the bottom, eddies round the space, without being able to check the upward draught from below. Mr. Cubitt's continuation of the flue to the basement also obviously affords a resisting column of air to effect the same purpose. It may be impossible to make such cavities large enough to overcome the effect of every down-draught, but these provisions against them will generally effect this desired end if combined with ample provision of air to the fireplace, such as Gibb's registered fireplace lintel.

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* That they are not in accordance with the general English feeling, the following extract from a letter from a visitor is testimony:—"The houses are kept too warm to please me in this country, and the hot air from the furnace as one goes up and down stairs makes me feel in a fever."

(*To be concluded next week.*)

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ON THE ORNAMENT CASTS IN THE ARCHITECTURAL MUSEUM.

THE second of these instructive and interesting "Saturday afternoons for art-workmen" was held on the 9th ult., when Mr. Brindley discoursed on the

NORMAN, EARLY FRENCH, AND TRANSITIONAL TO EARLY ENGLISH (FIRST POINTED) CASTS.

Mr. **Brindley** began his second descriptive lecture by elucidating on the black board the natural forms of the lotus and the papyrus, showing how the Egyptians adapted them to suit capitals and continuous enrichments, such as friezes and cornices, and how afterwards these forms were taken up by the Greeks, perfected, and adapted to their more refined architecture. He afterward demonstrated the acanthus foliage, showing by comparison its difference of treatment as exemplified in Greek, Roman, and Byzantine examples, and, lastly, as found in the Romanesque, after which he went on to explain the peculiarities and principles of Norman ornament, beginning with the simple cubical capital, showing how its faces became cushioned and fluted, and also enriched in a variety of ways with ornamentally carved and jewelled forms. He then went on to explain how the fluted work gave way to a simple foliage treatment of broad leaves, the ends or scrolls of the leaves chiefly turning back, and not having much projection, being generally kept within the line of the arch mouldings over abacus. He then proceeded to show the variety of ways in which these simple leaves were treated, and afterwards how, later on, they became subdivided, or reverted again to the acanthus type, as at Canterbury and other places. Diagrams were also made dissecting a capital, showing architecturally that the foliage was requisite to complete the capital by bringing the round column and bell into the square abacus. Bases of columns were then illustrated, and various modes of treatment to bring the column into the square base were shown. A lengthy and interesting series of sketches were also given on the principles of Norman surface decoration and arch mouldings, showing great variety by the use of simple forms. The zigzag form was shown to ripen into the dog-tooth enrichment of the Early English men. In conclusion, particular attention was called to the S. David's work as being most interesting as the connecting link between Norman fluted work and Early English. After the lecture, the examples on the walls were carefully examined and compared, and explained by Mr. Brindley.

Mr. **Brindley** delivered his third lecture on the 16th ult., taking the casts of the

EARLY ENGLISH AND EARLY DECORATED (EARLY FIRST AND SECOND OR MIDDLE POINTED).

The lecturer said that in commencing to examine the carvings of the Early English style, he thought they could not do better than begin at S. David's, where they left off on the previous Saturday, for, strange to say, Early English work might almost be divided into geographical belts, each district having its own peculiarities, and no doubt each district had its own school, so to speak. We found along South Wales, beginning at S. David's, and going from thence to Llandaff, and terminating at Glastonbury and Wells, a most vigorous class of work. He thought this work was most wonderful; it contained boldness without coarseness, and plenty of variety to give interest; and, architecturally, it was not second to anything we had. The carvings, particularly the capitals, did their work most charmingly. From this bold work of South Wales and Somerset, the lecturer then passed on to a more delicate type of work, as found a little further north—viz., at Salisbury, Worcester, Westminster Abbey, Stone Church (Kent), S. Alban's, and Lichfield. Of the Salisbury work there was a splendid collection of casts, consisting chiefly of capitals, spandrels, and label terminations; there was also a number of very fine casts from the Salisbury stalls, which were very noteworthy, woodwork of this date being very uncommon. Many of the casts were taken from Purbeck marble, which, in addition to their being so delicately carved, were also polished, as in the chapter-houses of Salisbury and Westminster. In reference to the casts from Westminster, the lecturer said the casts of the grand groin bosses, recently added to the Museum, must not be forgotten. The enriched jambs of the Chapter House vestibule were well worthy of notice. Mr. Redfern, in a future course of lectures, would doubtless call attention to the statues in these jambs, but the sprigs of foliage growing round about the figures were some of the choicest bits he (Mr. Brindley) knew of. It was particularly noticeable that one of those jambs, instead of having Early English foliage growing amongst the figures, had natural foliage, very beautifully carved, and distinctly showing that the Mediævalists could either execute foliage conventionally or naturally, as they chose. The casts from Stone Church, particularly the spandrels and elaborate dog-teeth, were well-known. Their pleasing line and interesting combination of dragon and foliage would stand any amount of observation. From Worcester and Lichfield Cathedrals there were not many casts, but the work was very similar to that at Salisbury and Westminster. The casts from S. Alban's were rather bolder, and partook something of the South Wales type. Passing farther north, great similarity was to be noticed between the Early English work of Chester and Bangor Cathedrals, the capitals being chiefly treated without bosses or turnovers. The casts in the Museum failed to convey a full idea of the force of the work, for in the real work the bell was seen right though the foliage. From Chester also there were some fine groin bosses. Art workmen would do well to study how the old masters succeeded in combining the figure and foliage in their bosses without losing the round of their material. It was done by keeping the figures flat and the shadow round; this gave boldness to the work when in its proper position at a considerable elevation. From Chester there were some fine casts of ironwork. These Chester casts were part of the collection presented by the late Mr. Hudson. From Chester Cathedral the lecturer next passed to Lincoln and York, and the Yorkshire Abbeys, particularly Fountains. Of Lincoln work, which was very vigorous, there was a good display of casts. The Angel Choir spandrels would be hereafter fully dilated on by Mr. Redfern. The capitals were exceedingly good, and well worthy of copying, as they contained just enough work to constitute a good capital: there was no redundant work about them. The crocket and label terminations were also good. York had some choice bits. In some of its pier capitals were introduced grotesques, and there was a distinct peculiarity in the treatment of some of the leaves; but, on the whole, the Early English carvings at York were not up to those at Lincoln and some other places. Fountains Abbey contained some wonderful work, and was very simple and useful, but there were no casts of it in the Museum at present. From Yorkshire, the work up through the northern counties, as seen in Early English work, was much the same. Some good specimens were to be found at Durham, from which place there was a cast of a monastic door-knocker, which every metal-worker ought to know. The best examples of Early English carving in Scotland were in Glasgow Cathedral, but as Mr. Brindley did not consider the Scotch work up to the English he passed it over. Having thus briefly noticed the most important places where Early English carvings abounded, the lecturer proceeded to glance at the characteristics of the style. Commencing with the capitals, the abaci were round in plan (except in the Early or Transitional work, as seen in the Wells and Llandaff district), or, in other words, the capitals were the same in plan as the columns. The masses of foliage were, during this period, so arranged as to retain the round of the capital both in plan and in profile, and however richly they might be filled up, the eye was always able to trace the bell of the cap right through. In this period, indeed, the bell and the abacus both became one. The capitals of this date were of undoubted good proportion, the abacus in the last examples being thus on the principle of a Greek capital. The lecturer here strongly insisted upon the value of the study of mouldings, remarking that if carvers would study mouldings a little more, particularly those immediately connected with carvings, they would reap much benefit, and avoid many errors that crept into modern work. The chief characteristics of Early English foliage were its stalks and round leaves. The stalks (or they might almost be called volutes) glided off in a most imperceptible manner, and consisted of a number of ribs and hollows. These were extremely difficult to copy, and, as a rule, in modern work they lacked all feeling. There was a great difference between the stalk of an Early English capital and a French one, for while the English volute widened as it grew, the French narrowed. These ribs sprang off the bell, much in the same manner as a vaulting rib would intersect on an upright shaft. The Dragon was represented in Early English work as a most subtle beast, with flat head, powerful sinewy jaws, cunning eyes, and with the neck generally twisted, showing graceful locks of conventional hair, thoroughly Greek in feeling and treatment, with short stiff forelegs and conventional wings. The legs were drawn amazingly strong, and were of the short alligator type. The wings were occasionally those of bats, but were more generally (particularly in Early English work) treated as conventional feathers. This dragon was of course a symbol of the Arch-Monster, Sin, and was frequently found in combat with the representative of Christianity—the Lion. At the entrance to the Chapter House, York, a very fine statue of the Virgin and Child stood on the two in combat, and the lion was evidently getting the mastery. The dragon was generally placed at the feet of recumbent statues of archbishops and bishops, representing the triumphing over sin. The lion as sculptured at this date was very Greek in feeling, as would be seen from casts in the museum from Salisbury Cathedral. Other animals were also occasionally represented, so as to take off the monotony of the foliage. Birds also were frequently used, and the graceful way in which they were introduced in Early English work was well worthy of imitation. There were some particularly fine examples in the Salisbury and Westminster work; also in Archbishop Gray's tomb at York. When they were introduced into finials a frequent way of using them was to make the bird look over his shoulder, so as to get a curve. Of the Early English style there were some most exquisite examples of ironwork, the peculiar characteristics of the style being the attenuated nature and the beautiful curves of the work. Dragon's heads were frequently introduced in metal work of this date, as in the examples at Chester, casts of which were to be seen in the Museum. Mr. Brindley said that if he were a metal-worker, and his clients would permit him, he should go in for that class of work, now that metal was so high in price, for in that kind of work a little iron went a long way.

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A new altar, tabernacle, and canopy, of alabaster and marble, were consecrated in the (Roman) Catholic Church of S. Chad, Cheetham Hill, Leeds, on Tuesday week.

LABOURERS' DWELLINGS FOR LIVERPOOL.

ABOUT a year ago a public meeting was held at the Law Association Rooms, under the chairmanship of Lord Derby, for the purpose of founding a company with the object of erecting model dwellings for workmen close to their places of work, with the view of proving that the building of such dwellings could be successfully undertaken as a commercial speculation. The share capital was fixed at £25,000, of which Lord Derby and several other leading gentlemen in the town subscribed £1,000 each. The new dwellings cover an area of nearly an acre of ground, and consist of two blocks, these two blocks comprising in all 132 tenements. Of these 132 tenements 48 are houses containing a living room and three bedrooms each, 28 are houses containing a living room and two bedrooms, and 48 a living room and one bedroom. On the ground floor, facing Latimer-street, are four shops; and the four basements facing the private west road are devoted to baths and washhouses. Each house is supplied with a water-closet. The sizes of the living rooms range from 12ft. 10in. by 12ft., to 12ft. 2in. by 11ft.; and those of the bedrooms from 14ft. by 10ft., to 9ft. 9in. by 8ft.; all rooms being 9ft. high. The floors of the houses in the basement are all laid with cement, as are also the scullery floors, all the other floors being boarded. The basement floors are in no case more than 4ft. below the street, or court, level, and have in front a continuous open area 5ft. 3in. wide, and railed off. The buildings are four stories or flats high (with the exception of those facing Latimer-street, which are only three stories), and on each flat there is a stone balcony the entire length of the building, and communicating with the staircases, of which there are two to each block, of York stone, at either end of the balconies. Dust-shoots, with iron openings on every flat, are provided the whole height of the buildings, one being placed between every couple of entrance doors. There is an open space, or courtyard, between the two blocks, 270ft. long and 48ft. wide, which will be laid with Staffordshire grooved tiles. At either end of this court, and communicating with Latimer-street on the east and the private road on the west, is an open passage 20ft. wide, thus allowing a free current of air from end to end of the property. The adjoining land on the west, abutting on the private road, has been purchased by the School Board for building purposes. The elevations are of common gray North Shore bricks, with Runcorn stone dressings and cornices, and chimney corbellings of patent red bricks. The balconies and staircases are of York stone. The architects from whose designs the buildings are being erected are Messrs. H. and A. P. Fry, of Castle-street; the contractor is Mr. W. Thornton, of Wellington-road; and the clerk of works Mr. James Peers. The cost of the buildings will be about £18,000, exclusive of land. The rents of the block now approaching completion have been fixed at from 4s. to 7s. per week.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Oxford Architectural and Archæological Society.—The third and last walk this Term took place on Saturday week, when Wadham College and Holywell Church were visited. Dr. Griffiths, the warden, who described the college, said, with regard to the chapel, or, at all events, the windows in it, it was the opinion of many people in former times, and it was the opinion of some now, that they were not of the date of the time of James I. He believed that Mr. Fergusson, who had written upon the architecture of it, held that opinion still. Mr. Blore, who was engaged forty years ago to do something to the college, held that opinion very strongly, and what he did to the chapel he did according to the style adopted about what he believed to be the date of the windows. The archives of the college were not examined at the time, and it was thought that everything that he recommended was the proper thing to do, but some years afterwards he (the warden), when a Fellow of that college, showed Mr. Blore what he had found in the archives, and he then admitted that his theory was wrong. The warden then explained what alterations had been made in the ceiling and other parts of the chapel. The oak panelling in the ceiling, which was so greatly decayed, and could not be repaired, was taken down, and Mr. Blore substituted what he believed to be more in accordance with the old architecture. The hall in which they were assembled was restored about fifty years ago—about the year 1823. Previously to that there was a plaster ceiling there, and the woodwork which was now open to view was hidden, and it was painted a dark green, which appeared to have been a favourite colour. At Holywell Church, the vicar, the Rev. G. Noel Freeling, was sorry the information he had to give them was very scanty. The earliest notice that he could find about the church was that it was built or rebuilt by Robert D'Oyley, who was the builder, as they were no doubt aware, of the Castle. He fancied that the chancel arch must have been some of his work. The next notice he found was that the tower was built or rebuilt by Henry Sever, who was Warden of Merton and First Provost of Eton College in the reign of Henry VI. The south aisle was built in 1844. Mr. James Parker remarked that he had looked to the evidence on the first point which had been laid stress on by Mr. Freeling, and the statement that the chancel belonged to Robert D'Oyley did not exactly recommend itself to his mind. He thought that there was nothing of importance to be attached to the arch, which was a round one, and might have been built at any time in the twelfth century, and this was the only part of the church that remained.

British Archæological Association.—At the meeting on the 27th ult., twenty-three members were elected. Specimens of "finds" in London during the recess were exhibited, and included one frontal and one entire skull of the *Bos Longifrons*, exhumed from Victoria-street, at a depth below the Roman stratum, and found amidst timber piles. Several tazza and urns were of dates varying from the fourth to the sixteenth century. Some curious knives were sent by Mr. Roberts, and some embroidery (*embossed applique*) by Dr. Kendrick. The Rev. Mr. Hodgson communicated a photograph of a Saxon memorial slab from Monkwearmouth Church, which, at a later period, had had the name erased, and another one, Ereberic, a priest, substituted; the original was probably of a contemporary of Bede. Of Roman works, Mr. Crickmay forwarded a fine drawing of one of the pavements at Preston, near Weymouth, not previously illustrated; and Mr. Grover produced drawings of a recently discovered villa at Teston, in Kent, on which he read a paper. He pointed out the similarity of the bathing arrangements to the villa at Chedworth. A manuscript collection, in two vols., of inscriptions and emblems on ancient bells, was sent by Mr. Stainbank, the earliest dated English bell being 1296, from Claughton, Lancashire.

Leicester.—At the last meeting of the Leicestershire Architectural and Archæological Society, a paper was read, written by Mr. North, on a piece of stained glass, which was exhibited, representing the Annunciation. The Earl of Gainsborough was elected a vice-president of the society. Major Joseph Knight exhibited the following relics found near Oswestry:—A bronze leaf-shaped spear head, with sockets and a loop on each side to tie it firmly to the staff; two bronze celts or axe heads, one with half-moon shaped blade; the bronze blade of a dagger, and a small square piece of bronze. Major Knight also exhibited two spurs, one of copper, which had originally been gilt, found near Glen Parva old Hall. The rowel of this has large long spikes, and the buckle was broken off. The other spur was of mixed metal, and had also probably been gilt or plated; it was quite perfect, and richly embossed; it had a large rowel with five long sharp spikes. Both spurs were considered to be of the early part of the sixteenth century. Major Knight also exhibited a small earthenware jar found at Pæstum, filled with mortar. It was about three inches high, with one handle. Also several specimens of pottery found at Glen Parva, in the Kirkdale close, consisting of part of a small Roman mortarium, part of a Roman square flue tile, and also part of a Saxon urn found in a Saxon interment.

SCHOOLS OF ART.

Cirencester.—The eleventh annual distribution of prizes to the students of the Cirencester School of Art took place on Thursday fortnight. The number of individual students during the year has been 97, exactly the same as in the previous year. The average number of attendances have been—in the day classes, 15, and in the evening classes, 27. The total attendances have been—day classes, 1,211, evening classes, 3,323.

Northampton.—The first annual distribution of prizes to the students of the Northampton School of Art took place recently. During the past year 120 students have joined the school—85 males and 35 females. The average attendance in the artisan class is 36; in the ladies' evening class, 22; and in the day class, 7, making a total average attendance of 65. The actual number of students for the present quarter is 88. The favourable progress of the school, during only the first six months after its establishment, is apparent by the results of the examination held under the regulations of the Science and Art Department in the month of April last. The school is well supplied with a collection of casts from the antique and from nature, approved by the Science and Art Department, and has a good supply of copies.

Building Intelligence.

CHURCHES AND CHAPELS.

Birmingham. — Another interesting discovery was made on Monday, in the course of the removal of the chancel walls of S. Martin's Church —namely, a fresco of S. Martin, the patron saint of the church. The saint is mounted on horseback, and is in the act of dividing his cloak between two beggars: the legend peculiarly associated with his name. The fresco was found upon the chancel wall, near one of the side windows. Unfortunately, its condition does not admit of its preservation, but careful tracings have been made, and memoranda of the "local" colour. The period is believed to be early in the reign of Richard II.

Gateshead.—Christ Church, Gateshead, was consecrated on Wednesday week. It has been erected from the designs of Messrs. Adams & Kelly, of Leeds. Its peculiar features are as follows:—The roof, instead of being divided into bays or compartments, consists of uniform rafters, placed rather more closely to each other than usual. The east end is apsidal, with five tall gables. Beneath these is a reredos of Caen stone and marble. Instead of leaving the west gable bare, the architects have run a porch across the whole western front, below the window. A small, light bell turret rises at the north-west angle. The cost, exclusive of the ground, the organ, and other special gifts, has been £6,100. Accommodation has been provided for 600 persons.

Hales Owen.—Restoration has been in progress in the parish church of Hales Owen for many months. The organ has been removed, together with the gallery which it occupied, under the tower. This has brought into view a groined roof and a fine lantern, from which light now comes into a part of the church which was previously darkened by the galleries. The interior walls, so far as they are of stone, have been relieved of plaster and whitewash. There has also been a restoration of the chancel arch, under the direction of Mr. Chatwin, of Birmingham. The church was reopened on Advent Sunday.

Levenshulme.—S. Peter's Church, Levenshulme, has recently been altered and decorated, from designs by Messrs. Maycock & Bell, architects, of Manchester. The walls of the aisles, up to the springing of the windows, are diapered on a buff ground, and above this painted a low green tone, being finished with an ornamental band, with text in black letters. The columns and caps, which are of stone, have a simple ornament in red lines, &c., disposed so as to assist their proportions. The clerestory walls are diapered under the windows, with an ornamental and lettered band under the sills, all on a buff ground, the tone above being green, as before. Crowning the clerestory walls is another band of varied ornament, with machicolations. The chancel arch is jointed with red foliated lines, the soffit having flaming stars; and the wall over the arch has two bands of ornament, the lower one lettered in black. The chancel is diapered with wheat, &c., up to the springing of the east window. Over this is a band of lettering, and above a running ornament of grapes. The east window has the dove in the apex of the ornamental gable that surmounts it. A new reredos has been fixed, having moulded arcading in Caen stone, with alabaster shafts and panels. Hood moulds have been placed round the nave arches and east and west windows, springing from heads modelled by Messrs. Williams & Millson, of Manchester, who also executed the reredos. The decorations have been carried out by Mr. J. Owen, of Bowdon.

Llanelly.—The foundation stone of the new church of All Saints, Llanelly, was laid on Wednesday week by the Bishop of S. David's. The church will consist of a chancel, with chancel aisles and vestry on the north side; a nave with north and south aisles, having clerestory windows; and there will be a tower on the south side of the church at the east end. For the present the tower will only be built to the height of the roof of the nave. The extreme length of the church will be 140ft., and its breadth 55ft., the height being 45ft. The chancel alone will be 43ft. long. The roof of the nave will be of pitch pine, open-timbered. Farleigh Down stone will be used for the interior of the building, the exterior dressings being wrought in Box Ground stone; in the rest of the building local stone will be used. The style is Gothic, and the total cost will be between £8,000 and £9,000, but only £4,000 will be required for the portion which it is proposed to erect now. Mr. G. E. Street, R.A., is the architect, and Mr. Williams, of Llandaff, is the builder.

Penninghame.—A new Episcopal Church was consecrated at Penninghame, Wigtonshire, on Thursday week. It is in the Early English Decorated style, and consists of nave, chancel, and organ-chamber, with a tower containing a peal of bells. The area of the church—70ft. by 22ft. in width—is seated for 200, and it is lighted by three stained-glass windows. Messrs. Habershon & Pite, of London, are the architects.

Rotherham.—The foundation stone of the Church of S. Stephen, Rotherham, has been laid. The church is in the Decorated style of the Geometric period, and the principal dimensions are, a chancel, 28ft. 3in. by 22ft.; nave, 90ft. 7in. by 25ft.; south aisle, with tower and spire at the west end, 78ft. 6in. by 11ft. 6in.; north aisle, with porch at west end, 90ft. 7in. by 11ft. 6in.; vestry on north-east side, 15ft. by 13ft. 6in. The roof will be open-timbered, with interlacing principals of stained oak. All the internal parts of the church will be of Hooton stone. The flooring to be of tiles, and the roof covered with red and gray slate in alternate bands. Externally the building will be of local stone with dressed quoins, and the facing will be of the same stone rock faced. The contract for the whole of the works was taken by Mr. Ripley, of Rotherham, for £3,000. The architects are Messrs. Barry & Son, of Liverpool, and the total cost, including site, will amount to £4,500.

BUILDINGS.

Coventry.—The new free library now being erected mainly at the expense of Alderman John Gulson, an ex-mayor of the city, is now rapidly progressing, and, occupying a site near to the two churches of S. Michael and Holy Trinity, groups well with those buildings; the north-east corner is purposely kept low, and forms an ante-room of one story only, so as to avoid obstructing the view of Trinity Church. The design is an adaptation of the Gothic, and the plans were furnished by Mr. E. Burgess, architect; the builder is Mr. James Merriot, of Coventry. The building comprises a large reading-room, lending and reference libraries, a committee-room, store-room, and offices. It is built of red brick, with Bath stone dressings, and will cost above £4,000. It is noteworthy that the site of the free library was lately occupied by a disused county gaol.

The Manor House, Charney, Berks.—The ancient manor house in this village is well known to most antiquarians and archæologists as being an interesting religious house of considerable architectural merit. Originally it appears to have assumed the shape of the letter H. The right-hand wing, consisting of refectory and chapel, and that on the left-hand, was used as kitchen and offices, while the middle portion had been modernised to form a farmhouse. Altogether it formed a most interesting relic, and its architecture, where it had not been tampered with, was good, but the whole building was in a lamentable state of decay, and must soon have ceased to exist, except as a ruin, had not steps been taken to restore it. At the commencement of the present year it was decided to at once set about the work, and Mr. Edwin Dolby, architect, of Abingdon, was instructed to make the necessary drawings for the same. From the first it was decided to do nothing more with the refectory and chapel than was absolutely necessary to prevent them falling to the ground; therefore the glazing of the windows, repairs of the walls and roofs, and the building, or rather rebuilding, some buttresses for the support of the walls, have formed the greater part of the work done to this right-hand wing, so that the refectory and chapel, together with the cellars under, may be seen repaired and supported, but, it is thought, not deprived of their interest. The left-hand wing has been taken down to the ground and rebuilt upon new foundations, and the middle portion has been restored, as far as possible, to the character it is presumed it had before it was tampered with. The sashes and frames which were inserted in the front of the house have been removed, and new mullioned windows of Ham Hill stone have been inserted, and are fitted with Messrs. Burt & Potts' wrought iron casements. The new entrance porch has a moulded oak roof covered with lead, and all has been done in the most substantial manner by Messrs. Honour & Castle, of Oxford, builders.

Stirling.—The Smith Institute, Stirling, is nearly completed. The style of the building is Italian. All the exterior walls are built with Dunmore stone, the front in ashlar, and the sides in coursed work. The interior of the building comprises an entrance corridor 63ft. long and 12ft. in width. On the left-hand side, on entering, is placed the library and reading-room, 50ft. long by 28ft. wide; and on the right-hand side a council-room and house for the keeper. Facing the entrance door, and at the extreme end of the corridor, is the entrance to the picture galleries, which, in order to suit the lay of the ground, are raised three steps above the front part of the building. These galleries comprise one room, 135ft. long by 27ft. wide, and another 105ft. long by 43ft. wide, with proportionate height. Parallel with the galleries is a museum room, 134ft. long by 25ft. wide; and behind the keeper's house, and entering from the right-hand side of the corridor, is another museum, 44ft. long by 24ft. wide. The work, except the mason work, which is being done by Mr. Sinclair, builder, Edinburgh, has been entrusted to Stirling tradesmen, and is being executed under the superintendence of Mr. M'Lean, master of works, Stirling, according to plans and specifications prepared by Mr. John Lessels, architect, Edinburgh.

SCHOOLS.

Aldershot.—The (Roman) Catholic school-chapel of S. Joseph at Aldershot was opened on the 21st ult. The new buildings are of dark-red brick with stone facings, from designs furnished by F. H. Pownall, Esq., of Montagu-square. They are in the Early English style, having an apse for the sanctuary, which during school-hours will be separated by a solid screen. The total cost is £1,096.

Bradford.—On Wednesday week, at a meeting of the Bradford School Board, Mr. Neill moved, and Alderman Law seconded, that the tender of Messrs. Wilson & Sons, for the erection of schools at Barkerend, at a cost of £12,300, be accepted, subject to the sanction of the Department. Several gentlemen objected to the cost of the schools as excessive, and it was stated that, including the expense of the site, the cost per head of the 500 children to be accommodated would be £34 5s. 7d., without including the expense of forming the playground. Leeds was referred to as a place where good accommodation was found at a far less expenditure. An amendment was adopted. The Chairman said that the wooden school idea had been abandoned, and at the next meeting a resolution would be brought forward recommending the adoption of four temporary school premises. Mr. Neill stated that they would probably be in a position to lay the foundation stone of the first school, that at Bowling Back-lane, next week.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

It is intended to issue in future, in the First Week of Each Quarter, a "Large Number" of the Building News, with a guaranteed circulation of

Twenty Thousand Copies.

Copies of these numbers will be forwarded to every Architect, Engineer, Builder, Contractor, and Surveyor in the United Kingdom, and to all in America, India, and the Colonies whose addresses can be obtained.

Space will be reserved for a limited number of Extra Advertisements, the charge for which will be as follows:

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Small Advertisements One Shilling per line.

Special arrangements may be made for a series of insertions.

The First Quarterly Large Number will be issued on January 3, 1873, and all advertisements intended for insertion therein should at once be forwarded.

Received.—M. C.—J. W. T.—N. W.—W. Y.—Drifting.—E. M. B.—J. P. S.—J. N.—J. H.—Stability.—M. & Co.—T. Brothers.—J. C.—E. & W.

E. S.—Because the atmosphere inside the shop is warmer than the atmosphere outside the shop.

Wm Stevenson (Hull).—A letter in reply to yours came back through the "Dead-Letter Office."

J. W. W.—See "C.'s" excellent reply (2675) on books, &c., for articled pupils, in last week's Building News.

J. N.—Returned because unsuitable.

Correspondence.

GRANITE BUILDINGS.

To the Editor of the Building News.

Sir,—I beg to send a few lines in reply to "E. G." As marble is only a limestone of a finer and more crystalline character than ordinary freestone, it is a chemical fact that it must, at a given temperature, be resolved into carbonate of lime. This degree of heat would be insufficient to damage the particular kinds of granite (igneous rock) I mentioned in my letter, and I must conclude either that the marble referred to was not subjected to its effects at the Boston fire from some cause or other, or that it is not a piece of marble at all, but lava or basalt. Granites vary almost as much in their component parts as freestones or marbles, and if "E. G" had read my letter carefully, he would have observed that I excluded certain kinds as unfit to be used. These would be soon damaged by fire from containing soda, potash, lime, and water. In proposing to me to substitute marble for granite "E. G." has forgotten to consider cost. This was one of the difficulties I had to meet, and as marble of average quality is ten times dearer than the best granite, "E. G." should—for his advice to be of practical utility—have met this difficulty before proposing it. In suggesting what I thought, and still think, would be an improved mode of construction for London buildings, I was perfectly aware that even the best granites, like every other material, except bricks, must give way to the effects of intense heat applied a sufficient time—it is simply a matter of degree—but the best marble will be destroyed sooner than the best granite, and, as I said, will cost ten times as much.—I am, &c.,

Upper Sydenham. Henry Travis.

CONCRETE BUILDINGS.

Sir,—I have been hoping for some time past to see a reply to the question of Mr. Sorby which appeared in your issue of the 8th ult., respecting the value of a concrete building as security for ground rent, mortgage, &c. I trust that by recalling attention to this matter we may obtain an answer from some one qualified to give a definite opinion upon the subject. From the tone of his letter, Mr. Sorby evidently implies that a concrete structure must inevitably rate below the worst description of brick building, but he gives no reasons for arriving at such a conclusion. The point thus raised is of the most vital importance to those interested in the use of concrete, and having been raised, should, if possible, be pressed to a solution.

Having superintended many thousands of experiments with various kinds of concrete, and having myself a firm belief in the future of concrete building, perhaps you will allow me to present a few data, upon which, as far as I can judge, the whole question turns. Setting aside the consideration of the relative values of a structure of brick and one of concrete considered merely in the light of old materials (which is not, I think, the question Mr. Sorby has in view), and regarding the respective structures simply on the score of durability, omitting also all reference to what I may term their residential convenience and fitness; looking, in fact, at these materials as a ground landlord might with a view to the termination of a lease, I maintain that, as far as our present experience goes, a concrete structure is superior rather than inferior to one of brick. This assertion is not made unadvisedly, for every experiment I have tried goes to prove it. Taking a ninety-nine years' lease, and estimating the value of a dwelling-house of brick and one of concrete, at the expiration of the term the latter would be in the better condition of the two. Of course, if the intention of the landlord were to clear the property for the erection of a better class of buildings, the concrete would cost three times as much to get rid of as the brick, but this is not a fair way to look at it. As a practical method of estimating the strength and soundness of concrete *versus* brick let me offer the following experiment:—Take six good sound stock bricks and bed them one on the other as two headers, two stretchers, and two headers again, with the best mortar you can get—Portland cement, one of Portland to three of sand, if you like. Then take the same bricks, break them up into small pieces and cast them with the same cement or selenitic mortar into a cube 9 × 9 × 9 as before, and you will have two test bricks of the same materials, compounded so as to represent work in brick and work in concrete. As the result of numerous experiments, I can affirm that as concrete the cohesive strength of the materials is improved from 20 to 30 per cent. The practical result of these experiments leads me to the following conclusion—by making clay into bricks we lose 30 per ct. in strength

At the risk of making my letter too long, I must crave space to point out what we lose in cost. Assuming that a rod of stock brickwork contains 4,333 bricks, which weigh 3 tons per M., or 13 tons of bricks; the value of 13 tons of brick earth burnt as ballast is 2s. 4d. per ton at the brickfield, or 30s. 4d. per rod; cost of 13 tons of brick earth made into 4⅓ M. bricks at the brickfield, 108s. 4d. per rod; loss, 78s. per rod. But to lay 4⅓ thousand bricks in mortar (four courses to the foot) we require 71 cubic feet of mortar, composed of lime, 1 yard, 9s.; sand, 3½ yards, 14s.; equal 23s. To make 13 tons of ballast into concrete, say 260 cubic feet of ballast, we require only 1½ yard of selenitic lime at 12s. = 18s.; loss, 5s. If my sum is correct (and I challenge investigation), by using clay in the form of bricks we lose thirty per cent. in strength, and spend over 40 per cent.* more than we should do if we made it into concrete. This calculation omits all reference to laying the bricks and mixing and using the concrete, and deals merely with a given weight of burnt brick used in two different ways. The conclusion to which it forces me is—Why make bricks at all?—I am, &c.,

GILBERT R. REDGRAVE.

ORGANS IN CHURCHES.

SIR,—The perfection to which the leading architects of the present day have attained in design, construction, and the proper disposition of architectural adjuncts, is so obvious and is so well known that it would appear to be impertinent and assumptive to direct attention to any supposed divergence from the paths of the three qualities above mentioned, and it is therefore with great humility and a sincere desire that no word here written may cause the faintest idea that I am not aware of the perfection and infallibility above alluded to that I am desirous to ask of these very great leading architects whether the present fashion of building organs in small chambers at the east end of churches is a proper and the best disposition of that grand instrument.

It is well known by organ builders, and of course equally well known by our leading architects, that, for the effective display of the qualities of the organ, it is absolutely necessary that there should be plenty of space above and around the instrument to permit the sounds to issue forth, and it can only be attributed to the justly earned reputation for, and to the practice of, originality, that the organ is by their special direction fitted into a chamber (the size of which they have themselves determined) just of sufficient dimensions to crowd in the various carefully thought out stops of the instrument, the large pipes in many cases touching the arch or ceiling of the chamber. The result of this is that the full and complete tone and beauty of the sounds are lost to the congregation, or they are so stifled and prematurely sent back that extreme harshness follows. Of course, it will be urged by the admirers of the leading architects that for ritualistic purposes they are compelled to have the organ at the east end, but it need not, I presume, be cooped up in a box, and it is only because of the fashion that it is so arranged. We know that the organs in French churches are placed at the west end, with plenty of room for the full display of the instrument, but then, French architects are *not* perfect.

I may also observe, subject to correction, that it appears to me peculiar that the church organ, after it has been artistically and scientifically built and studied, should lose 30 or 40 per cent. of its value, judging from effect produced, because certain leading architects take unto themselves work that can only be properly done by trained men. It is an injustice to the client, and a wound to the feelings of the organ builders.—I am, &c.,

W. W.

MOUNTING DRAWINGS AND TRACINGS.

SIR,—The writer of the very useful hints on this subject, given in last week's BUILDING NEWS, has pointed out the difficulty of employing a set square or scale to remove any air bubbles or superfluity of paste under the tracing without damaging it. I have found by using a paperhanger's roller this danger is avoided, and the mounting of large tracings is made comparatively easy.—I am, &c.,

M. B. A.

SKETCH BOOK.

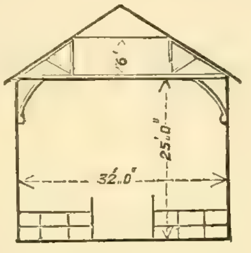
SIR,—I beg to propose that sketches, or rather details, from modern buildings be included in the next collection of sketches. Let us make sketches of any good bits we know of (without waiting for architects to lend their details, which few are likely to do). This will, I think, be quite as beneficial as studying the ancient buildings exclusively, and of far greater utility, especially to provincial students who are unable to travel.—I am, &c.,

A. J. W.

Intercommunication.

QUESTIONS.

[2713.]—**To Prevent Echo.**—We have a church here, and when there is a small congregation in it, it is almost impossible to understand what is said, owing to the continual echoing; but the reading, &c., becomes more audible when the congregation is large. I shall be glad if some one will inform me what is best to be done to remedy it. The dimensions of the nave are about as in sketch. The nave is quite plain, the walls, 18in. thick, being level, with the exception of recesses of windows, which are high and narrow, and break back about 6in. The seats are open form-like benches, and the ceiling is plastered up the rafters to the collar, and then flat; tie-beams shown. The chancel has a wood ceiling. The west wall is broken into the tower, thus forming a ringing recess or chamber.—J. N., Harlow.



[2714.]—**Asphalte.**—Will any subscriber kindly describe the way to make and lay the cheapest asphalte for laying on a ground floor to prevent the damp arising?—D. P. J.

[2715.]—**Church Building.**—Where are the Incorporated Church Building Society's regulations to be obtained?—Q.

[2716.]—**Leaky Bay Windows.**—I have two bay windows, the tops of which are laid with ⅞ths rough boarding, and on that a layer of asphalte. Over this again is fixed sheet lead, 7lb., and in one piece, without joints. The lead is nailed on its turned down edges with small copper nails. I may mention that the roof is flat. I am very much annoyed to find that in stormy weather the roofs leak badly, and it is all the more vexing on account of the extra care I took in seeing the work done under my own eyes. Can any reader name the cause and suggest a remedy?—H. F. C.

[2717.]—**Best Material for Taking Rubbings.**—Can any reader inform me what is the best material for taking rubbings on paper of ancient Gaelic or other remains? I lately saw some, but was unable to get rubbings.—AN OLD SUBSCRIBER.

[2718.]—**Flower Painting in Oil.**—What is a good work on flower painting in oil?—AN OLD SUBSCRIBER.

[2719.]—**Cleaning Walls.**—I have to clean the walls of a room which are finished to imitate stonework in sand. With what solution could this be best executed after dusting the walls?—DANIEL KIEL.

[2720]—**Architects' Assistants.**—Being about to enter upon a situation as an assistant in an architect's office, I would be glad to be informed if drawing materials, such as pencils, colours, Indian ink, &c., are provided by the principal or by myself. As assistants receive such good salaries I thought they would be expected to provide themselves with the above.—A CAPSTICK.

[2721.]—**Wood Veneer Paper.**—I am told that an improvement is made in the manufacture of wood veneers as a paper by an application of a linen backing, which, of course, renders the veneer less liable to crack, and more easy of application. Can any of your readers give me any information on the matter as to cost, &c.?—H. W. FOOT.

[2722.]—**Brickmaking.**—The clay from which I make my bricks is too rich by itself, having to mix blown or chaff sand for binding purposes with it. I would be extremely obliged if any reader would kindly inform me if sea sand would answer as well, and if it has to undergo any process, or what objection there is to it, as I could obtain the latter sand much cheaper.—SLOPMOULD.

[2723.]—**Chimney Shafts.**—Will some one kindly inform me if the inner shafts to S. Rollux and Smethwick (illustrated in Laxton's examples) are of firebrick, and also if the shaft to the East London Waterworks is lined with firebrick?—M. S.

REPLIES.

[2697.]—**Colours to Represent Materials.**—In answer to "One Intended for the Profession," I send the following list of colours usually used to represent materials:—

STONE.—*Elevation:* Roman ochre with a little Indian ink and carmine; or yellow ochre; or pale sepia; or light wash of Indian ink. *Shadows:* Light wash of Indian ink and Indian red.

BRICK.—*Plan:* Carmine or crimson lake. *Elevation:* Vermilion and little carmine; or gamboge and burnt sienna, with small portion of crimson lake; or carmine lake, burnt sienna, and Venetian red. *Section:* carmine or crimson lake. *Shadows* Indian ink and Indian red.

CAST IRON.—*Plan:* Indigo with a little carmine; or Payne's gray; or Indian ink and indigo with a little lake.

LEAD.—*Plan:* Thin Indian ink and indigo.

WOOD.—*Elevation:* Burnt umber or raw sienna and grain with burnt sienna.

EARTH.—*Plan:* Burnt umber.

CONCRETE.—*Plan:* Light wash of yellow with dark spotting of sepia and Indian ink.—T. C. H.

[2697.]—**Colours to Represent Materials.**—"One Intended for the Profession" has not yet received as complete an answer to his query as might be given on the above subject. The following list has been used in our office for some time, and is found sufficient for most purposes:—

BRICK.—Lake and burnt sienna.

BRONZE.—Indigo and burnt sienna.

BRASS.—Gamboge.

CONCRETE.—Any gray mottle.

CLAY.—Sepia and burnt sienna.

CEMENTS.—Sepia.

CAST IRON.—Indigo, lake, and sepia.

COPPER.—Gamboge and lake.

EARTH.—Lake and British ink.

PINE, DEAL, OR FIR.—Gamboge and a little burnt sienna.

GLASS.—British ink, Prussian blue, and gamboge.

LEAD.—British ink and indigo.

MAHOGANY.—Lake and sepia.

OAK.—Gamboge and warm sepia.

PLASTER.—Indigo and lake.

STONE ASHLAR.—Light British ink (speckle).

STONE WALLING.—Darker British ink.

SLATE.—Prussian blue and sepia.

TILES.—Burnt sienna and a little lake.

WROUGHT IRON.—Prussian blue.

The sectional tints same as those for plan, but in each case much darker.—M. B. A.

[2699.]—**Construction of Roof.**—The rafter from B to ridge should be a little stouter than other rafters. Frame in a cross-piece to receive ridge of small roof and the valley pieces D to B; this will give ample fixing. Iron straps should be introduced if roof is large or heavy. The water must be carried as suggested by "Country Reader" if necessary to be taken to E. Could "Country Reader" have a down pipe at A the drain pipe might be carried under surface of gronnd, and join down pipe from E.—T. C. H.

[2701.]—**Gauging Casks.**—Add together 39 times the square of the bung diameter, 25 times square of the head diameter, and 26 times the product of the diameters. Multiply the sum by the length, and divide the product by 31773·25 for the content in imperial gallons. $C = (39\ B^2 + 25\ H^2 + 26\ B\ H)\ L \div 31773{\cdot}25$.—T. C. S.

[2704.]—**Preserving Joiner's Work.**—One coat of boiled linseed oil put on immediately after or before the work is fixed will be found to answer the purpose. The stains from the plasterer's work are most to be feared, as, unless quickly cleaned off, they come out in dark patches when the wood is varnished.—A. E. A.

[2707.]—**Coloured Architectural Drawings.**—If "Progress" will drop a line to "Art," care of Mr. Smith, bookseller, Duke-street, Adelphi, W.C., he will get some information on the subject.—O.

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LEGAL INTELLIGENCE.

HOWARTH *v.* DAVEY.—This was an action in the Court of Common Pleas, on Friday week, to recover damages upon the ground that the plaintiff had been induced by false representations to take 500 shares in the Marezzo Marble Company.—The plaintiff's case was that in September, 1871, he saw this advertisement:—"Partner wanted with £500, to take a small interest and undertake the management of an extensive wholesale business monopoly. Well established and returning profits of 300 to 500 per cent. An excellent income insured." This advertisement emanated from the defendant, whom the plaintiff soon afterwards saw. Defendant told him that the business related to marble, that he was a principal proprietor, and that he had £100,000 invested in it. Further, that the shares were not in the market, and that a piece of marble which cost 6d. would sell for 1s. 6d., 2s., or 2s. 6d. The business he said had been established for five or six years, and he gave a card to view the works. The plaintiff went and saw the manufacture of the Marezzo marble, which was a beautiful article, and he was much pleased with it. He soon after paid £500 for 500 shares in the Marezzo Marble Company, and the defendant appointed him agent for Liverpool. The plaintiff did not succeed in doing any business there, though he incurred some liabilities beyond the £500, and he received nothing whatever in respect of his shares.—The case for the defendant was that about February, 1871, he purchased Bridell's patent for making the marble, and established the company. He had 5,000 shares allotted to him, and was the largest proprietor. As to the profits, it appeared from Laxton's Price-book that the marble sold for from 3s., to 4s. 6d. per foot, and the cost was only from 4d. to 6d. a foot. What he told the plaintiff was that the company was too small to be upon the Stock Exchange List, and that it partook more of the character of a private than of a public company, because there were so few shareholders in it. He never said that the company had been established for five or six years, nor, as was alleged in the declaration, that the company was well established with proof profits of 300 to 500 per cent. He did not say that the shares were not in the market, nor that he had £10,000 invested in the concern. What he did say was, that £10,000 had been given to him for the patent by the company. The statements which he made were true.—The above were the main points laid before the jury, but there was a great deal of evidence as to other matters connected with the company. Among other things, it was said for the plaintiff that the concern was about being wound up, whilst, on the other hand, it was said this was not so, and that gentlemen of position and means had agreed to subscribe £7,000 to buy up the company. Further, it was said that the defendant had sold the American patent for making the marble for £10,000, and had received £2,000 of the money.—Mr. Justice Byles drew the attention of the jury to the principal points in the case, which he said was an important one for the plaintiff, the defendant, and the public also. The law was that mere praise of the thing sold would not invalidate the sale; but if the jury should think that the plaintiff had been induced to take the shares by any one or more false representations, known to be false when made, then he was entitled to recover in this action.—The Jury, after answering certain questions put to them, found for the plaintiff for £567 6s. 9d.—Leave was reserved to the defendant's counsel to move the full Court, upon the ground that there was no evidence to go to the jury in proof of some of the allegations declared on.

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* The calculation of this percentage is omitted as being too lengthy.

Prosecution under the Workshops and Factory Act.—Messrs. Evans & Co., brick and tile manufacturers, Basford Bank, were on Monday summoned before Mr. J. Balguy (stipendiary) and Mr. G. Ridgway, at Hanley, by Captain May, sub-inspector of factories, on the charge of employing a lad, named Joseph Kilmartin, without registering his name and the date of the first day of his employment. The case was one of considerable importance to the trade, and in the court were many of the principal manufacturers of the Potteries. The defendants' works were until recently under the Workshops' Regulation Act, but instructions had been received that they must be placed under the Factory Act as earthenware manufacturers. The defendants made bricks and tiles, and quarries used for floors, which, according to the decision of the factory authorities, came under the definition of ornamental tiles. The defendants said they had registered the boy under the Workshops' Regulation Act, and Captain May contended that he should have been registered under the Factory Act.—The defendants said that a deputation from the Brick and Tile Managers of the Potteries had waited upon the Home Secretary, who told them that they might continue under the Workshops' Act.—Evidence was given by manufacturers of Hanley, tending to show that blue and red floor quarries and ridge tiles, which were grooved, and such as were manufactured by defendants, were ornamental tiles.—The defendants' solicitor, in cross-examination of the witness Peake, clearly showed that such a definition was not justified, and the stipendiary, in giving judgment (in which his brother magistrate concurred), said that he was clearly of opinion that the charge had not been sustained. The evidence of the witnesses as to the articles produced being ornamental had failed. In his opinion the tiles and quarries produced were not "ornamental" within the meaning of the Act. Charge dismissed. A week was given to allow of Captain May appealing if the Government thought right, but the captain intimated that it would not be done. The effect of the decision is to release from a degrading and unsuitable employment in the Potteries hundreds of girl children.

A Manchester Chancery Suit.—In the Court of Chancery, before Vice-Chancellor Wickens, the cause of Tomlinson *v.* Lowe has been heard.—Mr. Dickenson, Q.C. and Mr. Byrne, were counsel for the plaintiff, and Mr. Eddis, Q.C., and Mr. Begg were for the defendant.—It seemed from Mr. Dickenson's case that the plaintiff is owner in fee simple of a large warehouse, situate in Garden-street, Manchester, in the occupation of Mr. Halm and others. The warehouse has a frontage in and along the northerly side of a passage running into Garden-street of 61ft. 2in. or thereabouts, and on this front the warehouse has a basement partly above the ground level and four stories above the basement. In such basement and in each story there are seven large windows, all of which have existed, and use of light has been enjoyed by the warehouse for upwards of 20 years without interruption. After giving the various details of the building, Mr. Dickenson went on to say that the defendant in July last began to pull down the old buildings on his ground, and the defendant was communicated with by the plaintiff's solicitors as to the protection of the air and light enjoyed by their client's warehouse in case of any new building that might be erected by the defendant. Subsequently it was ascertained that the defendant did intend to erect a building that would interfere with the air and light, and in a letter the defendant's solicitors said their client had a legal title to his rights by a usage of over 20 years, and that the windows in the new building were carefully planned to include the lights which had existed in the preceding warehouse. There was further communication between the parties, and the defendant had several plans made.—Mr. Eddis said that if in one place light was taken to a very small extent, light was given in another part to a much greater one. After some discussion it was agreed that a plan known as No. 3, should be adhered to, and the defendant gave an undertaking to that effect, the costs to stand over until the hearing.

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STAINED GLASS.

Cardington.—A stained glass window to the memory of the late Mr. W. H. Whitbread, of Southill Park, has just been placed at the east end of Cardington Church. The window is the great east window, and the subject of the upper half, in five compartments, is the Crucifixion; that of the lower half is the Parable of the Good Samaritan. The window was designed and executed by Messrs. Clayton & Bell, of London.

Cirencester.—A stained glass window has been erected in the Lady Chapel of the parish church of Cirencester. It is of five lights, and the subjects are, the "Marys at the Sepulchre," "Our Lord at Bethany," and the "Anointing of His Feet." Messrs. Hardman & Co. are the artists.

Northampton.—Recently a memorial was placed in S. Giles's Church, Northampton, executed by Messrs. Clayton & Bell, London. The window consists of two lights. In the one is represented the full length figure of Faith, and in the other that of Charity.

S. Lawrence, Gresham-street.—A baptistry window has recently been erected in the church of S. Lawrence Jewry, Gresham-street, City. Its framework is an architectural composition of Renaissance character, with festoons of flowers and foliage and scrollwork, and with figures in niches. This encloses the two main subjects, "The Passage of the Red Sea," and "The Baptism of our Lord." These are selected as the parallel subjects illustrating the concord between the Old and New Testament; and as an authority for thus treating Old and New Testament subjects in the same window, it may be observed that the Venerable Bede mentions that "S. Bennett, Bishop of Wearmouth, placed in his church at Yarrow pictures of the 'Concord of the Old and New Testament,' executed with wonderful art and wisdom." The figures in the niches are those of David and Aaron, see Ps. lxxvii. 16, 20. It is from the works of Messrs. Cox & Sons, of Southampton-street, Strand, and was exhibited in this year's International Exhibition at South Kensington. It has been placed in the church to the memory of Mr. John Andrew Back, who with a mutual friend, in the year 1867, urged upon the Rev. B. M. Cowie that advantage should be taken of the Pan-Anglican Synod, then about to assemble, to create a fresh interest in missionary work in foreign lands. The various bishops then visiting this country were invited to preach, and the movement, which created great interest in lay as well as clerical circles, has resulted in the services for which S. Lawrence has now become famous. Mr. Back died in 1869, at the early age of 28, and his numerous friends have given the window to the church that his zealous services may be commemorated.

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Institution of Surveyors.—"Statistical Notes on the Prices of Agricultural Produce, Labour, and Rent, from the Early Part of the Last Century to the Present Time, with Remarks on the Present Aspect of the Labour Question." By Mr. W. Sturge. 8 p.m.

Architectural Association.—"On Professional Practice." Lecture III. By Mr. T. Roger Smith. 8 p.m.

Tuesday.—Institution of Civil Engineers—(1) Renewed "Discussion on the Aba-el-Wakf Sugar Factory." (2) "An Account of the Practice and Results of Irrigation in Northern India." By Col. W. H. Greathed, C.B., R.E. 8 p.m.

Wednesday.—Society of Arts.—"On Galvanic Batteries." By the Rev. H. Highton. 8 p.m.

Friday.—Architectural Association.—"History Illustrated by Stained Glass, and Exemplified in the Windows of Long Melford Church, Suffolk." By Mr. Charles Baily. 7.30 p.m.

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At last a commencement has been made in carrying out the drainage scheme at Oxford. Men have been employed in excavating for sewers in different parts of the city, and an advertisement has been issued announcing that the Oxford Local Board propose to apply to Parliament next Session for power to purchase lands for the construction of the main drainage works, and the purchase of lands below the village of Iffley, for the purpose of a pumping station and sewage irrigation in accordance with the recommendation contained in the recently-published report of Mr. Bailey Denton.

Our Office Table.

Reclamation of the Ferrara Marshes.—An Anglo-Italian Company has been formed for the purpose of reclaiming the Ferrara Marshes, which cover nearly two hundred square miles in Northern Italy, and plans for accomplishing the work were solicited from the most celebrated hydraulic engineers in this country and on the Continent. The choice fell on Messrs. John and Henry Gwynne, of Hammersmith, to whom the contract for the whole of the machinery has been given. The body of water to be drawn off the land is over 2,000 tons per minute, and as the consumption of fuel was a consideration of primary importance, the maximum consumption of coal is guaranteed not to exceed $1\frac{3}{4}$lb. per indicated horse-power per hour, the whole of the machinery to be delivered in ten months. The engines will be on the compound surface condensing principle, of 1,400 horse-power, working centrifugal pumps.

Effect of the Recent Rains.—At a recent meeting of one of the metropolitan vestries, Dr. Lankester, medical officer of health, reported that there had been one death from zymotic disease during the fortnight, and remarked there could be no doubt that the low mortality in the metropolis had been caused by the constant rains, which flushed the drains and sewers, and thus carried away the reeking filth which sent effluvia into dwellings, and was alike the cause of death among the rich as well as poor.

Institution of Surveyors.—The next meeting will be held on Monday evening next, December 9, when a paper will be read by Mr. W. Sturge, entitled "Statistical Notes on the Prices of Agricultural Produce, Labour, and Rent, from the Early Part of the Last Century to the Present Time, with Remarks on the Present Aspect of the Labour Question." The chair to be taken at eight o'clock. The following candidates will be balloted for:—As Members—William Havard Apperley, Hereford; Henry Parsons, Haslebury Plucknett, near Crewkerne, Somerset; Francis Newman, Ryde, Isle of Wight; John Pyne, Canford Manor, Wimborne, Dorset; Edward Robert Robson, 20, Great George-street, S.W.; William Edward Wright, King's Lynn; George Vulliamy, Metropolitan Board of Works. As Associate—Albert Low, 3, S. Helen's-place.

Peruvian Antiquities.—M. de Bunsen, Chargé d'Affaires in Peru, has sent to the Berlin Museum a curious and valuable collection of Peruvian pottery and other articles, which are all the more valuable from the fact that the ancient civilisation of South America was previously but poorly represented in the Ethnological Section of the Museum. Amongst the collection are several kinds of urns, some of early date, while others are the work of natives who had been converted to Christianity. The mummies are very remarkable. Three of them are completely clothed, and accompanied by the objects which are almost always found in Peruvian tombs, such as the bag for food, the drinking cup, and the loom and its accessories placed in women's graves. In one case, the mummy of a female has in its arms a clay model of an infant. The various textile stuffs in which the mummies are enveloped are extremely rare, there being but few examples in our museums.

Funeral in S. Paul's Cathedral.—We regret to have to announce the death of Mrs. Cockerell, widow of the late Professor Cockerell. The interment took place on Friday last at S. Paul's Cathedral, the body being laid in the south-east crypt, in the grave in which the mortal remains of Professor Cockerell were deposited, Professor Cockerell being, it will be remembered, the predecessor of Mr. Penrose as architect and surveyor to the Cathedral fabric. There is great difficulty now in finding grave room in S. Paul's, and coffins are necessarily placed very little below the pavement.

The Holborn Viaduct and the Letting of Surplus Land.—A curious "difficulty" has arisen in connection with the letting of some of the land on Holborn Viaduct. Messrs. Tress & Co. (according to a correspondent) have taken a plot of ground on the south side of the Viaduct, the entrance to which is by Turnagain-lane, Farringdon-street, and Messrs. Tress claim a portion of Turnagain-lane. Application has been made by one of the owners of property on the south side of the lane to the Commissioners of Sewers to open the ground in front of his premises, and make a coal vault under the pavement, and the Commissioners of Sewers granted the application. His builder commenced the works, and carted away several loads of rubbish, but when he went the next morning he found the hole filled up and a notice from Messrs. Tress not to proceed with the work, for they had men there to fill up as fast as he threw out the soil. They produced their plan, which shows that this portion of the street is let to them, which includes the frontage of the building on the south side, about 18ft., at which boundary they propose to inclose. The City paviors commenced repaving the disputed ground, but Messrs. Tress had men there to take up the paving as they laid it down. The police were appealed to, but refused to interfere unless a breach of the peace took place.

Mr. George Smith, of Coalville, and the Brickfield Children.—We have on more than one occasion referred to the philanthropic labours of this gentleman in improving the condition of brick-yard children, and we are glad to hear that some public acknowledgment is about to be offered to him. Few persons, beyond the range of the brick and tile-making districts of the country, have ever heard of the labours of George Smith, of Coalville, in lessening the miseries of the children who carry the clay to the grown-up workers. Happily, things are now, on the whole, mended, and at last Parliament has been forced to interfere. But it was the merit of George Smith that when no one else was these children's friend, he came forward and succeeded as their deliverer.

The Indian Public Works Department.—The Indian Public Works Department has succeeded in giving a deplorable illustration of its blundering incapacity. A telegram in an Indian paper, quoted by the Calcutta correspondent of the *Times*, states that a resolution of Government declares that the failure of the Saugor barracks is the most signal instance of the waste of public money which has taken place for years. The cost of the barracks is £166,000, and the committee recommend that they shall be altogether abandoned. Captain Faber has been dismissed from the Public Works Department, and his services are placed at the disposal of the Commander in-Chief. Mr. Crawford Campbell has been reduced to second grade superintendent engineer and Colonel Pollard to third-class chief engineer—both for one year. Mr. Armstrong was censured, and Mr. Fitzjames praised.

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CHIPS.

A well-known French historical painter, M. Janet-Lange, has just died at Paris, aged 87. He was a pupil of Ingrès, Colin, and Horace Vernet.

The Parisians are in a fright about the obelisk of Luxor, at the Place de la Concord. Some alarmist has discovered that the granite is cracking, and that the hieroglyphics are rapidly being effaced.

Mr. Rowland Plumbe, F.R.I.B.A., has been appointed, by the London School Board, architect for controlling the erection of board schools on a site in Monnow-road, Old Kent-road.

A company is being formed to manufacture in Sweden, and supply the trade in England with, the following goods—namely, ready-made doors, window-frames, mouldings, and other goods used by builders; packing cases, boxes, and similar goods, firewood and lathwood. The Secretary is Edward Rose Cowdray, 27, Leadenhall-street.

On Saturday afternoon the dedication stone of a new school for girls in connection with S. Thomas's Church, Ardwick, was laid by Mr. H. Birley, M.P. The total cost of the undertaking is estimated at £4,000. The architects are Messrs. Royle & Bennett, Princess-street.

On Monday morning the gas-works at Bray, County Wicklow, which are built on the shore, were undermined by the action of the waves, and the greater portion fell with a crash. The supply of gas was entirely stopped. The damage done is estimated at between £1,500 and £2,000.

On Monday the first schools in England built and opened under the auspices of a school board, were opened at S. Austell, Cornwall.

On Tuesday evening, Nov. 26, at a meeting of the Vestry of S. George-the-Martyr, Southwark, a letter was read from the Hon. Cowper-Temple, M.P., chairman of the Commons Preservation Society, stating that Mr. Francis Peek had promised to contribute £7,500, provided that the Governors of Dulwich College would dedicate for the public use 150 acres of their estate and form and maintain the same as a park. A motion approving of the formation of the park was adopted by the Vestry.

There was placed on Monday in the Parliament House, Edinburgh, a bust of the late Lord Barcaple, executed by Mr. William Brodie, R.S.A. The bust is characterised by breadth and refinement of general effect; and it, moreover, possesses all the advantage of having been sculptured from marble of apparently spotless purity. The bust stands on a pedestal of red granite near the entrance to the Advocates' Library.

On Wednesday week, the new service reservoir which has been in course of construction for the last twelve months at Darlington, was opened. The works have been designed and carried out by Mr. Hudson Reah, C.E., the borough engineer and surveyor; Mr. Joseph Nesbitt acting as clerk of the works. The total cost is expected to be about £6,500.

Trade News.

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TENDERS.

Brixton.—For the erection of two houses for William Everett, Esq. Messrs. Goulty & Gibbins, architects:—

Rowe & Verran	£1071

Finsbury.—For the erection of public elementary schools in York-road, Finsbury. Mr. T. W. Aldwinckle, architect. Quantities supplied by Mr. T. Nixon:—

Scrivener & White	£9983
Colls & Sons	9890
Higgs	9791
Brass	9790
Hearle	9780
Sheffield	9742
Browne & Robinson	9680
Carter & Son	9644
Cooke & Green	9617
Cooper	9540
Axford & Wheeler	9485
Peto Brothers	9332
Mansbridge	9286
Hill & Sons	9230
Langmead & Way	9150
Crockett	9150
Pritchard	8983
Henshaw & Co.	8975

Holloway.—For the erection of Welsh Chapel, Seven Sisters'-road, Holloway. Mr. A. G. Hennell, architect:—

Stevens	£1841	0	0
Pritchard	1630	0	0
Cooke & Green	1606	0	0
Richards	1599	5	0
Williams	1446	0	0
Heath	1295	10	0

London.—For additions and alterations to 19, Lawrence-lane, Cheapside, for Mr. Samuel Gibbins. Messrs. Goulty & Gibbins, architects:—

Colls & Sons	£400

London.—For the erection of new schools and offices at Hammond-square, Hoxton, for the School Board for London. Mr. Robson, architect. Quantities supplied:—

Hill & Sons	£7280
Perry & Co.	6590
Perry Brothers	6577
Dove Brothers	6475
High	6470
Roberts	6469
Browne & Robinson	6427
King & Son	6360
Pritchard	6144

London.—For the erection of schools, Woodpecker-road, New-cross, for the London School Board. Messrs. Elliott & Warren, architects, Parliament-street, S.W. Quantities supplied by Mr. Bagg, Whitehall-place, S.W.:—

Perry Brothers	£8777
High	8750
Gorrum	7700
Williams & Sons	7560
Newman & Mann	7496
Conder	7443
King & Son	7115
Marsland & Sons	6996
Jerrard	6989
Roberts Brothers	6974
Wicks, Bangs, & Co.	6962
Hill & Sons	6950
Dove Brothers	6875
Shepherd	6250
Architects' estimate	£5850
Add 10 per cent	585
	£6435

Cubic content of the buildings, 259,000ft.

Millwall.—For the erection of S. Luke's Parsonage House and schools, Millwall. Messrs. Hooper & Lewis, architects. Quantities by Mr. J. W. Forge:—

	Parsonage.				Schools.		Total.		
	£	s.	d.		£		£	s.	d.
Thomas	1750	0	0	...	2950	...	4700	0	0
Warr	1652	0	0	...	2952	...	4604	0	0
Robbins & Co.	1650	0	0	...	2935	...	4585	0	0
Sabey & Son	1690	0	0	...	2880	...	4570	0	0
Spearing	1751	0	0	...	2783	...	4534	0	0
J. Tibbetts, jun.	1536	10	0	...	2761	...	4297	10	0
Staines & Son	1588	0	0	...	2698	...	4286	0	0
Stephenson	1434	0	0	...	2643	...	4077	0	0
Lewin	1520	0	0	...	2478	...	3998	0	0
Morter	1470	0	0	...	2525	...	3995	0	0
Gibson Brothers	1451	0	0	...	2494	...	3945	0	0
Mansbridge	1436	0	0	...	2454	...	3890	0	0

Weymouth.—For sewers in Victoria-street, Weymouth, for the Local Board of Health:—

Stevens	£895
Weadley	731
Browne Brothers (accepted)	707

Woolwich.—For the erection of new schools, &c., in Powis-street, Woolwich, for the School Board for London. Mr. E. R. Robson, architect to the Board. Quantities by Mr. W. H. Barber:—

Gorrum	£3628
Enmor	3559
Newman & Mann	3535
Perry and Co.	3392
Riddell	3250
Kilby	3182
Johnson	3099
Jerrard	3083
Kirk	3080

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR PORTMADOC and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

COMPETITIONS OPEN.

Biggleswade.—For designs for altering and enlarging the Town Hall and Offices. A premium of 20 guineas will be given for the best design.—Mr. T. J. Hooper, Solicitor, Biggleswade, Beds.

Carlisle Public Hall Company, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

Chester Union, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

Crowle (Lincolnshire), January 1, 1873.—For plans, accompanied by specifications and estimates, for school buildings to accommodate 175 boys, 175 girls, and 100 infants. A premium of £5 will be given for the best and most economical plan.—Mr. T. T. Pearson, Clerk to the School Board, Crowle.

Llanelly School Board, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £3 per head. A premium of £15 will be paid for the plan approved of.—Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

Vienna, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

The Carlisle Diocesan Church Extension Society, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs. This competition is open to architects residing in Cumberland, Westmoreland, and Lancashire only.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

The Northampton School Board, January 27, 1873.—For designs for two new schools, with class-rooms and out-offices. One of the schools is to be built in Spring-lane, and is to accommodate 650 children; the other in Vernon-terrace, and is to accommodate 500 children. The architect whose design shall be selected will be appointed to superintend the erection of the buildings.—Mr. J. B. Hensman, Solicitor, Northampton; Offices of the Board, 6, S. Giles-street.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

Berwick Harbour, December 23.—For the construction of a wet dock and other works.—Messrs. D. & T. Stevenson, Engineers, 84, George-street, Edinburgh.

British Columbia, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

Dover Harbour, December 9.—For the supply of timber, bricks, lime and cement, ironworks, &c.—Mr. J. Stillwell, Registrar, Dover Harbour Board, Dover.

Great Western Railway, December 18.—For the construction of a goods warehouse and bonded store at Hockley, near Birmingham.—Mr. F. G. Saunders, Secretary, Paddington Station.

Haverfordwest, December 16.—For the erection of boys', girls', and infant schools, outbuildings, and boundary walls. Also master's and mistress's residences, &c., to be built at Prendergast.—Michael White, Clerk to the Board, Haverfordwest.

Haverfordwest, December 16.—For the works required in the erection of boys', girls', and infant schools, &c., at Prendergast, for the Haverfordwest School Board.—Mr. T. P. Reynolds, architect, Hill-street, Harverfordwest.

Ireland, December 14.—For alterations and additions to Aughrane Castle, near Ballygaar, County Galway.—Mr. Kempster, Architect, Ballinasloe.

Kingston-upon-Hull School Board, December 16.—For the erection of a block of school buildings in Daltry-street.—D. J. O'Donoghue, Clerk to the Board, Town Hall, Hull.

Lancashire and Yorkshire Railway, Dec. 10.—For the supply of the various stores required during the ensuing half year.—Mr. W. S. Lawn, Secretary, Hunt's Bank, Manchester.

Leeds, December 10.—For the slating, plastering, plumbing, and glazing of 14 houses in Bellevue-road.—Mr. W. H. Harris, Architect, 3, Infirmary-street, Leeds.

Leeds, December 14.—For the erection of one house, near Dewsbury-road.—T. G. Normanton, Architect, 1, Greenmount-street, Beeston-hill, Leeds.

Leeds, December 17.—Contract No. 2: For the construction of two forty horse-power engines, machinery, pumps, girders, columns, tanks, &c. Contract No. 3: For the erection of mill, boiler-house, engine-house, &c.—Alfred M. Fowler, C.E., Borough Surveyor, Town Hall, Leeds.

London and North-Western Railway, Dec. 17. For taking down a portion of the existing passenger station, and building a new one on the site.—District Engineer's Office, Crewe.

London and North-Western Railway Company, December 18.—For the construction of a new engine-shed at Carnforth.—Mr. S. B. Worthington, Engineer's Office, Victoria Station, Manchester.

Metropolitan Board of Works, December 19.—For the erection of stone walls and iron fencing on the Victoria Embankment.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

MIDLAND RAILWAY, December 10.—For the supply of low-sided goods waggons.—Mr. J. Williams, Secretary, Derby.

NARBERTH ROAD AND MAENCLOCHOG RAILWAY, December 16.—For the construction of a single line of railway, with approaches, conveniences, &c., from the Great Western Railway to Rosebush Slate Quarry.—Mr. M. T. Macdougall Smith, 1, Chapel-place, Duke-street, Westminster, S.W.

NORTH-EASTERN RAILWAY.—For the erection of a passenger station, and goods warehouse, and offices at Brotton and Lofthouse, in Cleveland.—Mr. W. Peachey, Architect, 16, Northgate, Darlington.

NORTH EASTERN RAILWAY, December 12.—For the erection of a goods and grain warehouse at Kingston-street, Hull.—Mr. Prosser, Architect, York.

NORTH EASTERN RAILWAY, December 12.—For the erection of a goods and grain warehouse at Lime Kiln Creek, Hull.—Mr. Prosser, Architect, York.

PRESTON AND WYRE RAILWAY, December 14.—For making a new branch, from near Kirkham Station to Wrea Green Station.—Mr. Axon, Engineer, Preston.

ROATH (near Cardiff), December 14.—For the erection of a Police-station.—T. Dalton, Clerk of the Peace, Cardiff.

ROCHDALE, December 10.—For the furniture and fittings for the Town Clerk's, Surveyor's, Gas, and Borough Treasurer's Offices in the Town Hall.—Mr. T. Mellor, Town Clerk's Office, Rochdale.

ROSS SCHOOL BOARD, December 18.—For the erection of schools to accommodate 420 children.—Mr. Rudge Rootes, Bank Offices, Ross.

SKIPTON WATERWORKS, December 30.—For the construction of a storage reservoir and other works.—Mr. J. Varley, C.E., Swadford-street, Skipton.

SKIPTON WATERWORKS, December 30.—For the delivery, at the Skipton Railway Station, of 12in. iron pipes, &c., to be cast vertically.—Mr. J. Varley, C.E., Swadford-street, Skipton.

SOHO, December 20.—For the erection of a new school in Crown-street, and a new north aisle to S. Mary's Church.—Messrs. Slater & Carpenters, Architects, 4, Carlton-chambers, 4, Regent-street, Waterloo-place, S.W.

THE GREAT NORTHERN RAILWAY.—BRADFORD, ECCLESHILL, AND IDLE, AND IDLE AND SHIPLEY RAILWAYS.—(First Contract) Osset and Dewsbury Railway, December 9.—For the construction of passenger station, platforms, waiting shed, and goods warehouse, at Earlsheaton, and large fireproof goods warehouse, offices, entrance gates, and weighbridges, cottages, &c., at Dewsbury. (Second Contract).—For the construction of passenger stations, platforms, waiting sheds, &c., at Eccleshill and Idle. And goods shed, coke stage, engine pits, crane, weighbridges, and other works at Shipley.—Mr. J. Fraser, Engineer, 19, York-place, Leeds.

TODMORDEN, December 24.—For the erection of the United Methodist Free Church and school.—Mr. E. Potts, Architect, Clegg-street, Oldham.

WEST HAM LOCAL BOARD, December 10.—For laying about 1,200 yards super of tar paving, about 200 yards of 3in. York paving, and other works.—Mr. C. Wilson, Town Hall, Stratford.

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BANKRUPTS.

TO SURRENDER IN LONDON.

Henry De Bruno Austin, Lancaster-gate, Hyde Park, and Ealing, builder, December 12, at 11.

TO SURRENDER IN THE COUNTRY.

Henry Winnerah, Barrow-in-Furness, builder, Dec. 10, at Ulverston.

SITTING FOR PUBLIC EXAMINATION.

December 18, R. & H. J. Coulthurst, Leeds, joiners.

DECLARATIONS OF DIVIDENDS.

T. Hughes, Arlington-street, New North-road, builder, div. 5½d.—W. Ashfield, Great Warner-street, Clerkenwell, and River-street, Myddelton-square, lately of Bayne's-row, Coldbath-square, bricklayer and builder, div. 1s. 4½d.

THE "ENGLISH MECHANIC AND WORLD OF SCIENCE," No. 402, published Dec. 6, 1872, contains Articles on:—Leaves Microscopically Considered; The Heating Effects of the Electric Current; Professor Tyndall in America; Galvanism in Metallic Plant Cases; New Sash Pulleys; An Instrument for the Identification of Persons; Solvents for Indigo; Transmission of Motion; Some Undescribed Properties of the Concentrated Rays of the Sun; Reviews; Coincidences and Superstition; The Recent Meteor Shower; The Meteorological Society; Useful and Scientific Notes; On Brightness; Coal and its Cost; Economy in the Use of Coal; Ventilator for Mines; Sidereal Time Indicator; Grand Examples of Caverns; The Rival Channel Steamers; Sea-Sickness and Steamers; On the Economy of Gas; Sliding Seat for Boats; A Hint to Paper Makers; Suggestions for the Improvement of Pianofortes; Heat; M. Hirn on Saturn; Targets; Deadening Sound; The Classification of Metals; Dry Gas-Meter; Aiming Guns of Turret Ships; Geometric Turning; An Altazimuth Equatoreal; Clips for Galvanic Connections; November Meteors; The Aurora Borealis; Red Aurora; The Flute; Mounting Drawings and Tracings; Horizontal Spectrum Lines; Cotton Spinning; Our Mathematical Column; Column of Paradoxes; Replies to Queries; Unanswered Queries; Queries; Chess; Answers to Correspondents.—Published at the Office of the BUILDING NEWS, 31, Tavistock-street Covent-garden, W.C.

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LEAD.

Pig—Foreign	per ton	£20 15 0	£21 0 0
„ English W.B. . .	do	21 15 0	22 10 0
„ Lead Co.	do	22 12 6	0 0 0
„ Other brands . . .	do	21 10 0	0 0 0
Sheet Milled	do	23 5 0	0 0 0
Shot, Patent	do	23 15 0	24 10 0
Red or minium	do	23 5 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	27 10 0	30 0 0
„ ground in oil . .	do	0 0 0	0 0 0

IRON.

Pig in Scotland, cash	per ton	£4 12 0	£0 0 0
Welsh Bar, in London .	do	11 0 0	12 10 0
„ Wales .	do	10 0 0	11 0 0
Staffordshire	do	11 10 0	13 0 0
Rail, in Wales	do	10 5 0	11 0 0
Sheets, single in London	do	14 10 0	17 0 0
Hoops, first quality . .	do	13 0 0	14 10 0
Nail Rod	do	11 10 0	13 0 0
Swedish	do	16 10 0	17 0 0

TIMBER.

Teak	load	£14 10 0	£15 10 0
Quebec, red pine	„	3 10 0	5 0 0
„ yellow pine . . .	„	3 5 0	6 0 0
Quebec oak, white . . .	„	6 10 0	7 0 0
„ birch	„	5 0 0	6 0 0
„ elm	„	4 15 0	5 5 0
Dantzic oak	„	4 0 0	6 0 0
„ fir	„	2 10 0	5 0 0
Memel fir	„	3 5 0	4 0 0
Riga	„	3 10 0	3 15 0
Swedish	„	2 10 0	0 0 0
Masts, Quebec red pine .	„	4 0 0	6 10 0
„ yellow pine . . .	„	4 0 0	6 10 0
Oregon	„	7 0 0	9 0 0
Lathwood, Dantzic, fm. .	„	8 10 0	9 10 0
„ St. Petersburg	„	9 0 0	10 0 0
Deals, per C., 12ft. by 3 by 9in.,			
Quebec, white spruce . .	„	14 10 0	19 0 0
St. John, white spruce .	„	14 10 0	15 0 0
Yellow pine, pr reduced C			
Canada, 1st quality . . .	„	21 0 0	24 0 0
„ 2nd do	„	15 0 0	16 10 0
Archangel, yellow . . .	„	14 10 0	15 10 0
St. Petersburg, yellow. .	„	12 0 0	13 10 0
Finland	„	7 10 0	8 10 0
Memel and Dantzic . . .	„	0 0 0	0 0 0
Gothenburg, yellow . . .	„	10 0 0	12 10 0
„ white . . .	„	9 0 0	10 10 0
Gefle, yellow	„	12 0 0	13 0 0
Soderham	„	0 0 0	0 0 0
Christiana	„	0 0 0	0 0 0
Other Norway	„	8 10 0	9 10 0
Flooring boards, pr square of 1in., first yellow . .	„	0 11 0	0 11 6
First white	„	0 9 6	0 10 6
Second qualities	„	0 6 0	0 9 0

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GUILDHALL, 25th November, 1872.—The Committee for letting the City's Lands will meet at Guildhall, on Wednesday, the 11th December next, at half-past one o'clock precisely, to RECEIVE PROPOSALS for LEASES of the following PREMISES, viz.: a House, No. 1, Albion-place, on the Surrey side of Blackfriars-bridge; a Workshop and Stables on the north side of Seward-street, Goswell-road; a Building or Workshop on the east side of Apple-yard, Seward-street.—Plans of the property may be seen, and forms of tender obtained, upon application at the Architect's Office, Guildhall.

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TO the GOVERNORS & SUBSCRIBERS of the BUILDERS' BENEVOLENT INSTITUTION.—MATTHEW SAICH begs to return his most sincere thanks to all who so kindly interested themselves to secure his election this day, the 25th of November, 1872

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 13, 1872.

LANDSCAPE GARDENING ON THE THAMES EMBANKMENT.

THE Thames Embankment, undoubtedly the hugest work that has been undertaken in this metropolis, may, as regards its masonry, be considered successful. It is to be regretted that the treatment of the reclaimed ground is unworthy of its engineering and architectural adjuncts. Ten years ago the view of the Thames from Westminster Bridge eastwards was, for picturesqueness, unrivalled. At high tide or low tide the grand widening of the river, with its stairs, private boathouses, and manifest evidence of riparian proprietorship, could not fail to impress those who had eyes to see. The very names of the streets here are historical. Long before the Cardinal, smelling a stuffed orange, went, with much ceremony and attendance, from what is now Somerset House, to audience of his king, the banks of the river were owned by great noblemen. The days when Majesty took barge at Whitehall Stairs, tide favouring, are passed. The magnate of the City has not for a quarter of a century been entrusted to the strong arms and experience of the guild. The City Barge, of less antiquity and less historical interest than the *Bucentaur* of Venetian celebrity, is now a commodious embarcation to be hired for purposes of picnicing. The *Bucentaur* has been honourably housed and allowed to rot in the Arsenal of Venice.

An Act of Parliament, tardily passed, overrid the claims of riparian owners. Sentimental damages were allowed, and most handsomely paid for. People who at low water had nothing in prospect but mud, gained of solid earth a garden of reasonable size, and a prospect unmatched in Christendom or Heathenesse. It is to the use of ground reclaimed, and devoted to the public with some ostentation, that we now claim attention. The proprietorship of the ground is vested in the public. The public, as taxpayers, paid the charges, and it is not unreasonable that the public should know how their money has been spent. Apart from the engineering works of the Embankment, which are most successful, the community has little to congratulate itself withal. A walk from Villiers-street to Waterloo Bridge will show, to the most short-sighted, the incompetence of those entrusted with the execution of a great public work. The humours and careers of a retired merchant, who at Peckham Rye, Camberwell, or Denmark Hill, plants his cabbages, and sets up for a man of taste, do not concern the public. His house, land, and everything that is his, are his own to use at his pleasure. The Thames Embankment does not stand in a similar case. The Metropolitan Board of Works are trustees of the public, who pay the piper, and have a right to the full value of the money they pay. Can any one who has seen the so-called ornamental grounds call them worthy of the metropolis, or worth the money they cost? The great mistake in the treatment of the reclaimed ground lay in ignoring its surroundings. Manifestly on made ground, with the lines of buildings never to be entirely shut out, and the water level at hand to tell the tale like a philosophical instrument, the devisers have proceeded as though they had to deal with a suburban plot on a hill-side. Artificial mounds have been put up, sinuosities of path have been affected, borders of flowers skirt shrubberies, difficulties have been created but not overcome; in short, it would not be easy to point to another work of public importance where the first principles of landscape gardening have been more persistently violated (always excepting the improvements in Hyde Park, in the neighbourhood of Albert Gate) than the ornamental ground between Villiers-street and Waterloo Bridge.

The proper treatment of the ground is manifest. The boundary line separating the Embankment grounds from the slums of the Strand, including the arches of the Adelphi and ignoble outhouses of all kinds, should have a screen wall somewhat similar to that which screens the buildings in Whitehall-place. All attempts at rural landscape-gardening should have been avoided, and the whole attention of the designer directed to urban embellishment. Rural landscape-gardening and urban embellishment are very different things. A central avenue of plane trees, the only trees which thoroughly withstand the London smoke, terminated at the Charing-cross end by a handsome architectural entrance—the York Stairs' Gate, for example, now ignobly buried at the foot of Buckingham-street—would be infinitely preferable to the meaningless paths, leading from nowhere to no whither, which at present puzzle the public. A central basin of sufficient dimensions, or an architectural mound of masonry or terra-cotta to contain flowers, would be quite enough in the way of floriculture. The ground should be, in fact, treated as an arboretum, not as a parterre. In the neighbourhood of the Strand few evergreens thrive. The holly, almost the hardiest tree we have, exists but does not thrive. Neither laurel, bay, nor aucuba flourishes; ivy, if of the right sort (which that on the ground alluded to is not), does fairly; box never comes to much, and the coniferæ are out of the question. Such an avenue, with paths of minor size at either side, following winding lines of shrubbery, with a flower bed here and there, would give a character to this end of the Embankment that nothing else can do. The making of Barnstaple, in North Devon, and Durenstein, on the Danube, is the grove which forms the promenade. That the Embankment proper is bordered by trees makes little difference. What is wanted is a mass of foliage to mask as much as possible the hideous termination furnished by the Charing-cross Station. York Stairs, at the foot of Buckingham-street, was most ostentatiously spared under the Act only to be two-thirds buried. It might be raised to form an entrance to Buckingham-street, or to terminate the avenue proposed. As it is, its situation is deplorable, and in the last degree disgraceful to the Metropolitan Board of Works.

To Blackfriars is but a step, thanks to the Embankment, and here the Thames improvements stop, and the improvements to the City proper commence. The gas-works are to be removed, and none too soon for the safety of the neighbourhood. Keyser's Hotel is to be erected on a grand scale. Already a large building is in course of completion at the head of Blackfriars Bridge. The style is Alhambra Moresque, Messrs. Lacy and Elsdon contractors. The ground floor is at present the booking-office of the Metropolitan District Railway. The upper floor is intended for a café. Great works are in contemplation in continuance of Queen Victoria-street to Blackfriars Bridge, the most important of which is the new terminus of the London and South-Western Railway; and the London, Chatham, and Dover Railway has already advanced an outpost as far as the site of the old Fleet Prison. This station, known as the Holborn Viaduct Station, is intended for the accommodation of passengers using all the railways south of the Thames—*i.e.*, Chatham and Dover, South-Western, Brighton, and South-Eastern; the last-named company having yet to make their connection near Blackfriars, the other companies being already in communication with the present system at Ludgate-hill. The new station will be entered on a level with the Viaduct, and will be about 500ft. long and 150ft. wide, in addition to which an hotel 40ft. wide, with frontage to the Viaduct of 180ft., will be built between the station and the Viaduct. The style of the station is the usual engineer's conglomerate; the hotel is in the hands of Mr. L. H. Isaacs, of Verulam-buildings. The cost of the works, station and hotel, is probably a quarter of a million, half of which sum is for purchase of the land. Here the progress of City improvement stops. The Viaduct buildings are not fully tenanted, and the great cost of foundations deters speculators from building. The Viaduct is a great public convenience, but the adjoining property can scarcely be profitable to the proprietors.

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ENDOWMENT OF ART AT OXFORD AND CAMBRIDGE.

THE leading advocates of Science and Archæology have resolved to establish a "Society for the Organisation of Academical Study," in anticipation of the redistribution of the endowments of Oxford and Cambridge, whereby considerable revenues may become available for the higher educational purposes of the country. The promoters of this organisation announced their intentions at a public meeting held at the Freemasons' Tavern, on Saturday, November the 16th. They maintain that the chief end to be kept in view in the redistribution of those endowments is the adequate maintenance of mature study and scientific research, for their own sakes, and also for the purpose of bringing the highest education within the reach of all who desire it. They justly complain that our Universities do not foster a class of students, common in the German Universities, and in France, who are enabled to devote their lives to mature study because it affords the means whereby they can obtain a livelihood. In Germany this class of student is called *gelehrter*, in France he is known as a *savant*; in this country there is not even a name for such a person. The promoters of this new organisation propose to find both a name and a career for a corresponding class in this country. They assert that "to have a class of men whose lives are devoted to research is a national object;" and further, "that it is desirable in the interest of national progress and education that professorships and special institutions shall be founded in the Universities for the promotion of scientific research."

The archæologists—who were represented at the meeting by Mr. C. T. Newton, the keeper of Greek and Roman antiquities at the British Museum—advocate the establishment of museums in the Universities, where practical acquaintance can be made with the monuments of antiquity, and an organisation for the especial study of archæology, with "professors to bring before students the best results of that science throughout Europe."

With such objects there will be a general concurrence of enlightened public opinion, as far as they go. Of course, in the preliminary stage of a comprehensive scheme which may be regarded with jealousy and hostility in other powerful quarters, general ideas alone can be advanced. At the proper time, the propounders of the new scheme will no doubt be fully prepared to supply methods, means, and details. But at the onset, and without waiting for the increased power which this new society is certain to gain, it must be urged that the general basis of its scheme is altogether sectional and limited when considered as one of "national progress, and the "higher education of the country." The promoters must enlarge their views and strengthen their position by, at once, including the fostering and study of Art at the Universities as a fundamental part of their scheme. On national considerations, they must be prepared to admit that Art has equal claims to those already urged on behalf of Science and Archæology.

Unfortunately, neither of the Universities can supply other than exceptional instances of members of their own body who are eminent in, or alive to the value of, the study of Art. They must, therefore, be content to accept the co-operation and support of those without their own circle who are qualified and willing to act with them. That they will accept such co-operation there can be no question. Precisely the same arguments stated by them on behalf of the endowment of Science apply with corresponding force to the endowment of Art. Probably, were the relative positions of Art and Science as they now exist amongst us accurately ascertained, it might be found that Art has the greater need of encouragement. It certainly has a paramount claim, for Science has already an established footing and distinctions which society, or rather, the public, respect; while Art, in a national sense, has no grade, no diploma, no defined location in the higher education of the country, beyond the extremely inadequate and somewhat exclusive recognition which a limited number of artists obtain as members and associates of the Royal Academy.

It would be a waste of time to recapitulate the national results which must follow the introduction of the study of Art at the Universities. The rapidity of progress therefrom may be conceived by reference to the immense influence which Oxford has exercised upon the revival and development of Gothic architecture, and yet architecture forms no part of the academic studies, nor has the study of Gothic architecture been confined to those members of the University more especially interested in church work. The study has been so general among both clergy and laity that it may fairly be said to have modified, if not moulded, the taste of the whole kingdom during the last thirty years. That which has been done for architecture, as a mere incidental study, we may reasonably anticipate will be accomplished in an equal degree for all the arts, should they be included in the University curricula. Nor is it necessary to urge the more complete intellectual power which the mind acquires by a study essentially productive of those two qualities declared by Mr. Matthew Arnold to be the chief characteristics of Oxford training—"sweetness and light." A more important consideration at this time is that of ascertaining whether the revenues which the Royal Commissioners may report are available for redistribution will be sufficient to include the endowment as a new course of study.

On this point Sir Benjamin Collins Brodie, one of the speakers at the meeting before referred to, said he had "the strongest opinion that when the report of Mr. Gladstone's commission is published, and the true revenues of the Colleges of Oxford are made known to the House of Commons and the world, the greatest surprise, and, he might say, the greatest indignation, will prevail." The chairman of the meeting, Dr. Mark Pattison, Rector of Lincoln College, said:—

> Another notion of University reform which we shall have to meet is that of transplanting a certain portion of the University revenue into the manufacturing and commercial centres of the population. That is an idea which has evidently taken deep root, and it more or less runs counter to our object not altogether, but more or less. But that idea has taken such deep root, that I doubt whether, if we were to try, we could prevent something of that sort being done. But I confess I am not myself altogether opposed to something of that kind being attempted, and if we find in the Bill, when it is drawn, that there is some such proposal as the sending down a number of young men into the country, and paying them by means of University funds, and locating them in these manufacturing centres although I do not care much about its being done, and I should not propose it—I think it might be made compatible with our views. If these persons who are sent over to Manchester and Liverpool are entirely under our direction, and are made not mere persons who go and deliver an evening lecture for the amusement of ladies and gentlemen in Manchester, then I think it would be very desirable if something like a connection between the Universities and the centres of population could be opened. One great complaint is that the manufacturing and commercial interests have outgrown us; that they no longer regard us; that they do not think we have got anything worth having, and of course it would be very desirable to reconquer that class of society, and bring them back; and I think this tendency which I see in the public mind, to dispose of a portion of the University money, in sending it down to these places, might be directed in such a way as to regain the possessors of wealth for us.

These remarks of Dr. Pattison carry the question into a more comprehensive phase than that of merely considering what available revenues there may be for a special endowment. Clearly, there will be no lack of funds; and, almost as clearly, it appears that there will be no selfish action on the part of the promoters of the new movement in their redistribution. The practical point as affecting the interests of art is, therefore, well defined. Certain national advantages may be secured. By what means? is the next query. The immediate course of action to be adopted appears to be the formation of a society to promote the interests of Art in the Universities; or, the incorporation with the Society already formed of influential patrons of art, artists, and art manufacturers from all parts of the kingdom. Such a combination could not fail to exert an immense influence, and would be almost certain to achieve success.

CUSTOM AND INVENTION IN ART.—CONVENTIONAL EDUCATION.

MODERN art and our system of education are so intimately connected, and the former may be considered such a special outgrowth of our modes of thought and emotion, that any efforts to improve art or to establish any rational principles for its development must be directed to the foundation of our intellectual and social nature. A system of education which is founded not on our natural faculties, but on customs, conventions, and traditions of the past—on an *artificial* basis, in fact—cannot possibly promote the arts of invention and design. Professors of and lecturers on art stupidly—if I may be permitted to speak so scornfully—imagine our modern want of originality and power to arise either from a degeneracy of our natural faculties for art—a falling away from ancestral virtue in this respect—or they assume no higher perfection can be attained, that art has seen its best days and has reached its maximum strength, and that all we have to do is to study it with a blind zeal and reverence. The assumption of this impassable excellence for ancient art at once sanctions copyism or imitation of the most abject kind. It permits no improvement, no radical change, unless it be called by some disparaging name. These teachers imagine even that by a close imitation and study of ancient art, some return to the original condition of mind and circumstances of the ancient artist can be ensured. It is true, sometimes one hears students recommended to study Nature as the fountain of all perfection, but the advice is generally accompanied by a counter one to "study the works of the great masters of antiquity," as if Nature alone is not sufficient, and that we require to look at her only through "great masters." I have often been struck with this singular perversity in art teaching. Even so great a master as Sir Joshua Reynolds says: "Study Nature attentively, but always with those masters in your company." Why study in this second-hand way? It puts one in mind of an intermediate priesthood. Professor Poynter says, rather inconsistently: "We must try not to encumber our minds with ideas, but rely on our perceptive faculties," and, afterwards, "above all, we must study the works of the great masters of antiquity." The fact is, if Nature is to be studied, and our natural perceptions improved, ideas and conventionalities of thought and expression must be ignored; or, as we cannot do that, they must be made to hold a subordinate place in our teaching. Till this is done, our "art," as I have before said, will be nothing but an art of *second-hand* expression, or at the best, a *réchauffage* of ancient ideas.

Education is at the root of the matter. A learned education—I mean by this one in which the traditions of the past, the dead languages, or, in short, a classical education, is the principal element—is too often a hindrance to inventive talent and success. Let us see why it is. It may be summed up in a few words: *an unnatural cramming.* Schoolmasters, or the majority of them, are ignorant of that *one study* which should be of all others the greatest—namely, the natural evolution of the faculties. Helvetius says, in his work on "Man," "There are many books and many schools, but few persons of understanding; there are many maxims, but they are seldom applied; man is old, but still a child." In previous papers I have shown that our teaching is begun at the wrong end, and I have supported this opinion on authorities which cannot be lightly thrown aside. The great work of Comte, and the masterly treatise of Dr. Spurzheim,* are, perhaps, two of the most important, though several recent thinkers and writers, Herbert Spenser among them, have clearly demonstrated the irrational character of our system of education, and its failure as giving results incommensurate with its influence. I will not here trouble my readers with references to these works, though I would recommend them to study and apply their principles, and I believe after they have done so the influences of tradition, association, or prejudice—however intense or emotional may have been their power, or with however much veneration, amounting to almost religious enthusiasm, the art of the past may be held—will be considerably diminished in their minds.

The construction of our system of general education is lamentably in fault. One radical mistake is want of attention to the physical laws of nature and their bearing on certain faculties of the mind. Children are dragged through spelling-books and artificial signs of knowledge before they really have the faintest ideas of the objects themselves. Experience has proved that minds of promise which have been thus early plunged into book knowledge before the faculties have any indicated manifestations, or the bodily constitution has acquired some strength, have become enfeebled. Again, the primitive faculties of the mind are not consulted at all; hence we see young men made musicians and artists who ought to have been lawyers or mechanics. Each intellectual faculty, instead of being exercised by practical application, excited by sensation or perception, is either not called into requisition at all, or is so burdened by artificial ideas as to be practically useless. At present all our school knowledge is acquired by signs and symbols, the meaning and value of which, instead of being precedent, is learnt afterwards. We have words before their meaning, in fact. The memory is taxed verbally, but the intellect is left unexercised. Learning words and phrases and formula can never give us the sensations and perceptions of things on which alone our reasoning powers must depend, and yet we are often told Greek and Latin or mathematics are the best studies for improving our reasoning faculties. How fallacious, it needs little to prove. Our faculties of thought are fundamental, and have nothing in common with classics or mathematics. Now, it is this error into which art teachers have fallen; they fancy there must be some connection between signs, or the mere language of art, and our faculties for design. They also, like the conventional schoolmaster, inculcate a thorough study of the Greek and Latin modes of art, as if they gave us ideas or exercised our inventive faculties! It cannot be too clearly stated that we may exercise our faculties of form, or proportion, or any other, without learning signs to denote such ideas, in the same way as we may become learned by repetition or rote in language or conventional forms, without understanding their meaning. Words and forms of art-expression cannot produce notions; but, on the contrary, hamper and restrain conception.

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* "A View of the Elementary Principles of Education," 1821.

To dwell on the suggestive analogy between ideas sought to be conveyed by written signs as languages, and art ideas taught by the learning of Greek or Gothic forms, no one will say that the cramming of Greek and Latin words or phrases into a youth can gave him a new idea; and if this be admitted, can a similar process help the student of architecture? I say it cannot. But to resume the method of school instruction. Ancient languages, while they allow the faculties of mind to lie dormant by the manner in which they are learnt, should be really the last and least important branch of knowledge taught. It is true they are interesting as containing the primitives of a great many words in our own language; but the derivation of a word is not of so great importance as the idea or object which is represented by it, and of which it is the mere sign. Now, it should be borne in mind that *perception* is the earliest faculty of the mind, and, therefore, the mind should be stored at an early impressionable period with tangible facts and ideas, and those studies which clearly promote interest, inquiry, and observation should be first taught. Are they so? No: the opposite course is pursued. Abstract formula, dry definitions, and rules and propositions are dinned into the ear. Observation and experimental study, the most interesting, are made quite subservient to grammatical construction and analysis. The plain truths of geometry, mechanics, geology, and chemistry, instead of being first, are studied last. Again, history may occasionally vary such studies; but in this also the salient features should be first taught, not a mere dry catalogue of dates, invasions, battles, and political events, without any apparent connection, and which only tax the mind. In short, all knowledge should be conveyed, in conformity to a recognised and regular law of nature, by which the simplest physical facts are first acquired, and then proceeding to the more concrete and complex; in fact, the gradation of study should be one of relation and dependence, in which the faculties of observation, comparison, abstraction, and analysis are successively called into action and developed.

My readers will see I have not overstated the facts of the case, when I assert this law, or gradation of study, is entirely ignored, or the natural order reversed, both in the value of the facts taught and their relation. I will next show how this system of instruction affects professional education and the arts. G. H. G.

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WATER POWER.—IV.

THE wheels last described are current wheels, and there are many situations where they may be most usefully employed, especially in new countries, and where other forms could not readily be adopted. The power of such wheels may be determined on the following considerations:—If the wheel be fixed, and the current of water impinge against the float-boards, it will do no work, but the effort of the water, tending to turn the wheel round, will be the greatest possible—will be the maximum—effort that the water is capable of when running with its actual velocity. On the other hand, if the wheel be freed, and it offer so little resistance to the current of water as to move with it—that is, with the same velocity—then again no work will be done, there being no resistance. Between these two states there is one which produces the maximum effect, or greatest amount of work. When the water is at liberty to escape sideways as fast as it impinges on the float-boards, as it does in current wheels, it can be shown by a process of reasoning that the effect is a maximum when the float-boards move with a velocity equal to one-third of the velocity with which they would move if there were no resistance, or one-third of that of the current of water; and also that the most effective force with which the water can act on the wheel is four-ninths of its utmost force when its head accumulates against the float-board when the wheel is held still. This force is equal to the weight of a column of water whose base is the area of the immersed float-board, and whose height is that due to the velocity of the current. That height is found thus. The force of gravity constantly adds a certain quantity of motion, second by second, to a body falling freely, whatever actual velocity it may have attained at the end of any previous second, and this quantity is $32^{1}/_{6}$ft., and is usually represented by the letter g. In the first second, after falling from a state of rest, it falls a distance of $16^{1}/_{12}$ft., being the mean between zero when at rest and $32^{1}/_{6}$ft., the velocity it has acquired at the end of the first second. For practical purposes such as these, we are considering it is sufficiently accurate to take $g = 32$, and h, the height fallen through in the first second, $= 16$. The velocity will then be for any height, $v = \sqrt{2\,g\,h}, = \sqrt{64\,h} = 8\,\sqrt{h}$; and conversely, the height corresponding to any given velocity, v, will be $h = \frac{v^2}{64}$, v being the velocity in feet per second. Supposing, then, the velocity of any stream employed to turn a current wheel to be found by experiment to be 8ft. per second, the height from which it must have fallen to produce this velocity is $\frac{8 \times 8}{64} = 1$ft. Supposing the immersed area of the float-board to be 10 square feet, the force of this current on this immersed area of float-board would be $10 \times 1 \times 62\frac{1}{2} = 625$lb. But this is the whole force due to the stream of water, and can only take effect when the wheel is held still, and therefore, of course, is doing no work. When let go it will move with a velocity, compared with that of the stream, which will be due to the extent to which it may be loaded, and the maximum effect, or greatest amount of work done, will take place when the force acting on the float-board is $\frac{4}{9}$ of the whole force of the stream, or $\left(\frac{4 \times 625}{9} =\right)$ 277·7lb., and when the velocity of the wheel is $\frac{1}{3}$ of that of the water, or $\left(\frac{8}{3} =\right)$ $2\frac{2}{3}$ft. per second, the work done will be that of raising $(277{\cdot}7 \times 2\frac{2}{3} =)$ 740lb. 1ft. high per second, which is about $1\frac{1}{3}$ horse-power. This takes account of only one float-board, but it has been found by experiment that by making the number of float-boards greater than is strictly required in order to keep one float-board always fully immersed, a greater effect is produced, and taking this practical increase of effect into account we may say this wheel would be, at least, $1\frac{1}{2}$ horse-power. Taking two-thirds of the power expended to be effective we find this wheel to be 1 effective horse-power.

FIG, 4.

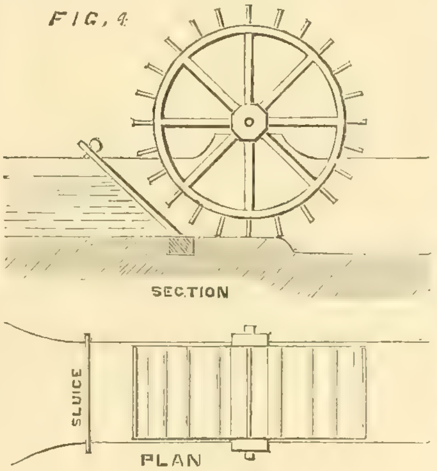
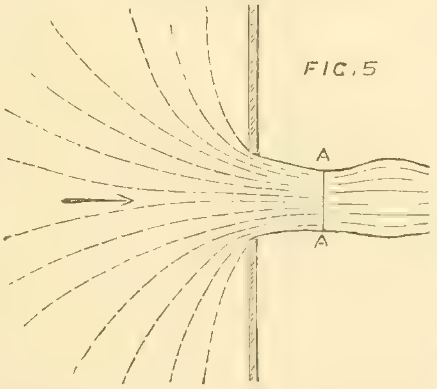


FIG. 5



Where a stream can be confined in its channel so as to make all the water that impinges on the float-boards continue to act upon them until the wheel releases it, the best relative velocity of the wheel to that of the stream is one-half, instead of one-third when unconfined. And under these circumstances the wheel above-mentioned would be $\left(\frac{3 \times 1}{2} =\right)$ $1\frac{1}{2}$ effective horse-power. But when the circumstances of the situation are such that an artificial channel can be made to bring the water to the site of the work the wheel is taken out of the category of current wheels and becomes a proper "undershot" wheel; as, for instance, where a stream, being small, may be wholly dammed up for the purpose of gaining a few feet head of water without causing it to overflow the banks of the stream above, or do other damage; or where part of the water of a larger river may be diverted from a point at some distance above the site of the intended wheel and brought to it in an artificial channel having a less rate of inclination than the river itself, so that a few feet head of water can be accumulated, then a proper undershot wheel may be applied.

The undershot wheel is an improved form of current wheel; both depend for their efficiency on the impulse of the water, as distinguished from its mere gravity. But instead of being placed in an open current, the wheel is fixed in a close channel, or race, of masonry, very little wider than the wheel itself, and the water is penned up by a sluice-gate, moving in grooves in the side walls, issuing beneath it when raised by means of a rack and pinion. Fig. 4 represents such a wheel. Because the efficiency of this form of wheel depends upon the velocity which can be induced in the jet of water, the approach to the opening through which it issues is differently formed from other openings through which merely quantity of water is required; the side walls being made to converge towards the opening, and the sluice-gate being placed in a sloping position; at least, this should be the form. Sometimes the sluice-gate is placed vertically; but the effect of placing it in a sloping direction is to increase the velocity of the water issuing from under it, as compared with that through an abrupt opening, and as the effect of water acting on an undershot wheel is in respect of its velocity—and actually as the square of its velocity—any increase of that element which can be obtained by arrangement of sluices is to be desired. Water issues from openings into the air with the velocity due to heavy bodies falling from a height equal to the head of water, or the vertical height from the centre of the opening to the surface of the pent-up water (with however some abatement, to be hereafter referred to), and when the opening is so formed as not to impede the flow of water, the quantity issuing is nearly that due to the area of the opening multiplied into this velocity. Many openings from which water is made to issue are so abruptly formed that the actual quantity is much less than the quantity so found, because, although the water attains the velocity due to its head in the axis of the vein, or jet, at some short distance outside the opening—that is, at the point of contraction of the vein—yet it does not do so equally throughout its cross section, the friction against the sides of the opening retarding the flow of the outer portions. When water flows out of an opening into the atmosphere it approaches it from all sides, as shown in Fig. 5, and, in issuing, its viscidity causes its particles to shoot across towards and meet in the section of contraction (A A in the figure). The cross sectional area of this part of the jet cannot be measured in practical works, but on a smaller scale it has been measured and compared with the area of the opening. Experiments made on the flow of water through holes in thin plates—and, therefore, under circumstances where the water issues abruptly—show the sectional area of the *vena contracta* to vary from about one-half to about two-thirds of the area of the orifice from which the water issues.

In constructing the sluices of undershot water wheels they should therefore be made so that the water may have an easy approach to the opening through which it is to issue, for then, the retarding influence of the edges of an abrupt opening being reduced, the mean velocity of all the filaments of water passing through an opening will be much increased, if the opening be placed in such a position as to occupy the place of the contracted vein.

This question of increased velocity must always be taken in conjunction with the area of the opening, for it is not an absolute increase, but a relative one—relative, that is, to the area of the actual opening. If an abrupt opening be placed at a distance in front of the point where the issuing jet is to take effect, equal to the length of the contracted vein, the velocity at the point of contraction would be the same as through an opening with converging sides; practically the same, although there are minor influences which affect it slightly. It is on these considerations also that the mouth of a pipe into which water enters from a reservoir is made bell-mouthed, or trumpet shaped, so that immediately after entry the pipe may run full bore.

The damage done by the recent floods in Italy might lead one to suppose that in that and neighbouring countries hydraulic laws are not understood. Sir John Rennie, in a letter to the *Times*, can show how floods may there be prevented, or at least how damage from them may be obviated; and yet it is chiefly from continental experimentalists that English engineers have received their elementary knowledge of hydraulics.

On that part of the subject now under notice—the phenomena of spouting fluids—the following are the chief authorities, and the results of their experiments. Du Buat (*Principes d'Hydraulique*) gives the relation between the diameter of the jet at the point of contraction and that of the orifice as 6 to 9, from which we deduce the relative areas 4 to 9; the Abbé Bossut (*Hydrodynamique*) as 41 to 50, or in area as 16·8 to 25; Daniel Bernoulli (*Hydrodynamique*) as 5 to 7, or in area as 25 to 49; J. B. Venturi (of Modena) as 4 to 5, or in area as 16 to 25; Michelotti (of Turin) as 4 to 5, or in area as 16 to 25; MM. Poncelet and Lebros, French engineers, from a number of experiments on a larger scale, found the relative areas to be as ·62 to 1, or nearly as 5 to 8. It will be found useful to compare these latter relative areas with the co-efficients of actual discharge to be presently mentioned.

The first practical step to be taken in constructing any work in which water is to be used for power must be to ascertain what quantity of it will issue from any opening of given dimensions under a given head of water, and, therefore, it is worth while to go to the root of the matter before proceeding to particulars of construction. Although the experiments made on the form which water assumes when issuing from an opening, and to which we have before referred, have necessarily been made on a smaller scale than that of general practice, yet they are very useful guides to the comprehension of the reasoning on larger affairs, and help to account for anomalies between that which we find to be the result by experiment, and that which we should expect on theoretical grounds alone. But it is always so in constructive works; the best and only true results are to be arrived at by comparing theoretical knowledge and experimental knowledge together, and ultimately uniting them in practice.

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ON WARMING AND VENTILATING HOUSES.

By J. P. Seddon, F.R.I.B.A.

(*Continued from page 446.*)

The use of pipes for the lining of flues has the advantage of compelling a good and non-porous finish, which would otherwise be neglected by careless workmen, who often will not take the trouble to properly parget and core the flues in stone and brick walls. The interior of the pipes, however, should be rough, and by no means glazed, or their inability to give any means of adherence to soot will be found a nuisance, in consequence of its continual dropping. The old funnel-shaped throat left a large space above the grate filled with cold air, which checked the draught. This depends much upon the grate itself; but, generally speaking, the flue should be contracted to its smallest size as soon as possible above the mantel. Iron frames for this purpose, serving as mantel-bars as well (such as Gibb's registered fireplace lintel), are useful appliances. A concrete block may be made of the shape required at perhaps the least cost.

The opposite plan of making flues like funnels reversed was some years since advocated in professional journals by a practical man, who reasoned that because smoke expands as it rises, this humour should be accommodated, and he maintained that his practice founded thereon had been successful. It consisted of commencing, as I have advised, with the flue of the smallest dimensions, and gradually increasing its area on each floor of the ascent. This is correct when rapid combustion is required to be promoted, as in boiler-fires, for the generation of steam, but would entail an inconvenient thickness of walling. and be at least troublesome to execute generally. Mill chimneys need not be built so high as they are if so constructed, instead of tapering upwards.

The height to which flues should be carried is generally determined by various circumstances, and it is obviously impossible that all in a house should correspond. The higher they are, undoubtedly the better draught, but the few feet in addition gained by an ugly tall-boy to flues upon a many-storied dwelling is obviously an attempt to effect a cure in a wrong direction.

The terminals of a chimney-stack may, and should be, simple, if due attention has been given to the more essential points. I have seldom found more needed than a partition slab of stone rising higher, so as to divide the flues, and prevent the smoke from one being driven or drawn down another. Billing's patent terminals, widely advertised and used in London, are simply slabs of this kind in terra-cotta, of a design which is neat, though not gaudy, and they have replaced many thousand tall-boys, to the advantage of our aerial perspectives; for the short flues on upper floors a sunk pot is added. In certain positions, down-draughts from the vicinity of higher objects, and currents of wind, can be guarded against by simple guards which are not unsightly, such, for instance, as a flat stone supported by blocks at the angles. The more complicated sort of straight jackets by which smoke, which is a remarkably free agent, is sought to be coerced, are more ingenious than necessary. If the upper part of the flue be made V-shaped, as in some beautiful Venetian examples, it is said that the wind may puff into them with impunity, but practice, apparently in contradiction to this theory, seems to point to the contraction of the outlet as by ordinary pots as the more efficacious.

Before quitting the subject of chimney-stacks, it may be mentioned that their position as regards the roofs is more important than is generally thought. Strong winds directed against their slopes rush upward, and will carry with them smoke from chimneys in their route, but will drive it right down unhappy flues placed at such a distance on the other side as are open mouthed to receive them just where they pitch downwards again. The ridge of the roof, therefore, is a safer starting point (and should be secured if at all possible) for a chimney-stack generally to be placed, and a transverse hood or bonnet the most probable cure when a stack is already in a less fortunate one in this respect.

The construction of the fireplace itself is, however, of the most importance. The contraction of the flue immediately over it is the first point to be looked to, and, next, the provision of a proper supply of air for the combustion of the fuel. To illustrate this in the simplest manner, I may refer to a small room with a large fireplace in it, belonging to a friend, which was complained of as simply uninhabitable by reason of the draughts that invaded it from all sides. A piece of iron pipe, with lower end protruded through the outer wall, the middle brought through the fire, and the upper end open to the room, stopped all cause for complaint. The reason for this is so obvious that it seems hardly credible that a vast majority of dwellers in houses are enduring continual torture for want of this pipe, or some equivalent simple appliance. One looks in vain along the walls of our streets for any signs of air-bricks or other inlets of air, and with closed doors and plate-glass windows one wonders where the air comes from to feed the fires within. There are but few available sources, which are these:—1. The joints of the window-frames and chinks round doors, through which cold blasts whistle as they are sucked in, so that these are pasted up, and, as far as possible, this means of supply intercepted. 2. Unused flues of other rooms down which air pours, mixed with smoke. 3. The soil and waste pipes, the water in the taps of which cannot hinder the precious element from coming, even by such undesirable channels, in obedience to the powerful suction of the several fires in the house. These failing, there are positively no other sources. Then fortunately, the fires begin to smoke, and doors and windows are, perforce, opened to abate that, by far the smallest and least dangerous nuisance of the whole.

The remedy for this is to provide a sufficiently ample supply of pure fresh air in such a manner that it may come in moderately warm, and from such quarter that it be not felt as a draught. There are several means of doing this, each hotly maintained by its partisans to be the only fit and proper one. The bottom, the centre, and the top of the room, are each pointed out as being specially adapted for the purpose by those much-enduring laws of nature, and the course of the currents of air demonstrated by flights of the most obedient and flexible arrows. This certainly may be taken for granted; if openings be made in any or all of the positions indicated, the laws of nature will make a beneficial use of them, but it will be capriciously, one moment as inlet and one as outlet, as the occasion may need. The fire being the motive-power of the currents, the direction that the air will take if it can, will be in a straight line to the fireplace, and therefore, to obviate disagreeable draughts, the air-inlets must not be placed so that currents thence must necessarily impinge upon the inmates of the room, as in the case of the undesigned ones of the chinks round the doors and windows. Again, they should not be so near and below the grate as to rush direct to feed the fire, and thus not only not aid to ventilate the room, but absolutely take from the fire that valuable office. By far the best mode, in my opinion, is to introduce the air below the hearth and carry it thence through warming chambers at the back or sides of the grate, and allow it to issue into the room above the fireplace, or from the outer sides of the chimney-piece, so that it must ascend and mix with the air in the room before it finds its ultimate exit by the fireplace or outlet flue. In fact, the fireplace itself should be the fountain of warmed fresh air to an apartment, since no draught thence can be annoying to any of the inmates of the room. The air may be brought, according to its position upon different floors, from below by air-bricks inserted in the walls between the joists; or from above the roof by a flue constructed for the purpose, and if this flue be carried in close connection with the chimney-flue, whether in separate pipes, as by Mr. Jennings' method, by the use of Boyd's metal withs, or ordinary brick ones, the air drawn down by the suction of the fire will have the temperature considerably raised above that of the outer atmosphere, the coldness of which entering by windows is unendurable.

As regards grates, the varieties of which are endless, I can only deal with some of the more prominent points of those at present before the public, and note the principles which are or should be observed in them.

The more that firebrick or fireclay enters into the composition of the part which encloses the fire the better. It absorbs heat which would otherwise escape, and can communicate it to air passing through spaces in contact with it, without the unpleasant, and doubtless unwholesome, sensation caused by air which is overheated by contact with iron.

The depth from front to back should be small, sufficient that the body of fuel be not too soon exhausted, but no more, or much of the heat generated within the mass of fuel, being prevented from radiating, will be lost.

The form of the back, by what is called the Milner plan, described in a letter to the *Standard*, by

Mr. W. H. Wheeler, C.E., being in shape like the angular part of the letter K, projecting inwards, about a foot above the grate-bottom, and then returning back, is good, as the angle catches the flame and reflects it into the room, and the smoke curling round the projection, comes in contact with the red-hot fireclay, and thereby is partially consumed. The bottom of the grate by this plan is raised not more than 4in. above the hearth, and is of solid firebricks or a fireclay slab; the fire made on which gives greater heat and consumes less coal than in ordinary grates.

The slow combustion-grate, advertised by Clark & Hunt, has the fire so placed on a low slab, and enclosed by firebrick, but would be improved by adding the Milner back. Existing grates may be brought partly under the same conditions by fitting plates of sheet-iron over their gratings at the bottom, to prevent air entering from below. The grate should be half filled with nuts of coal, and the fire made upon this stratum of fuel and allowed gradually to burn down to it. Dr. Arnott's grate is upon this principle, having a box with supply of coal beneath, which is lifted as required upwards to the fire above. The principle would be still further carried out by having the flue beneath, instead of above the grate, if proper draught could be ensured; but systems of descending flues are seldom to be depended upon.

There is, without doubt, ecomony in the plan of thus burning coal downwards; but it demands patience as well as care, for it takes a long time for the fire to become a good one, and it is apt to become dull, so that when really cold a poker frequently disturbs its stratification. Then, though some descriptions of coal can so be wholly consumed, other ashes of other qualities cannot, and thus the fire becomes choked.

To enclose the space underneath the bottom formed by an iron grating, would answer the same purpose of preventing air feeding the fire from below, and yet allow ashes to fall through, and these could be removed daily by the servant, by means of a removable door.

The late Mr. Pierce's (now Penfold's) fire-lump grates, and those of Mr. Edwards and others, are good in having the fire surrounded by fireclay, and the backs grooved behind for the passage of air to be warmed and conveyed where desired. They would be improved by one or other treatment of bottom suggested, and by the Milner form of the back, as also by the provision of a larger space for warming air behind. The invention by Messrs. Young, of Queen-street, Cheapside, recently described in a letter to the *Times*, for introducing fresh supplies of coal when needed into ordinary grates and ranges, into the bottom instead of on to the top of the fire, has the same desired end of making the smoke pass through an already heated mass of fuel and so becoming consumed, and loss of heating power prevented. Mr. John Taylor, of Whitehall, has an extremely ingenious patented arrangement by which the smoke, after it has risen from the fire, is diverted by a damper and made to pass round and re-enter the grate at the lower part of one side, and pass through deep bars, of which the bottom is composed, so that the smoke is consumed, and only gaseous products of combustion escape through the other side to the flue proper. Thus the fire is intensified and made brilliant, creation of soot in the flue to a great degree prevented, and fresh air is admitted from the front of the grate through chambers in the substance of the fire-brick sides, which have had the heat passing entirely round them. Mr. Taylor has recently at my request simplified its details, so that it should be as self-acting as possible, which I consider essential.

Captain Galton's stove has excellent merits in a roomy accessible heating chamber behind; in the proper connection of the flue from grate with the brickwork flue above, so that smoke cannot leak into hot-air chamber; in the facility of introducing the warmed air through any part of the chimney-breast, or to other rooms; and in the shape of the back being concave, so as to have the same effect as the Milner back; but it would, in my opinion, make this grate more economical to shut off the air from the bottom, and feed it only from the front and top.

Mr. Boyd admits warmed fresh air copiously by an ornamental panel above the fireplace opening, whence it rises into the room. This, or the sides of the chimney-breast, are as good positions for inlets as can be chosen; but, if the air enter by the hearth or sides of grates, it will be drawn at once by the fire, and defeat the purpose of ventilating the apartment.

Such grates and arrangements, however, seldom find their way into the bulk of the houses of the middle class; it may be well, therefore, to state that, of ordinary ironmonger's goods, those which have regulating louvres or small doors to the flues at back are economical of heat, minimising the portion that escapes to the flue. Provision of air, however, must in some shape be secured, unless health is to be sacrificed.

Greater economy and more heat will be obtained by those who confine their metal-work to the front bars, and simply construct the rest with firebricks or fireclay slabs.

(*To be concluded.*)

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THE BEAUTY OF FITNESS.*

IT is on the principle of the Beauty of Fitness that the architect who would produce a fine building ought undoubtedly to proceed. Let him think, and that neither lightly nor superficially, what the thing is that he has undertaken to do. What purpose is the structure, whatever it may be, which hs is to set up intended to fulfil? Is it one large enclosure—a church, a Parliament House, a theatre, a concert hall? or is it a collection of apartments of various sizes—a college, a hospital, a cluster of courts or chambers to be used for business purposes? Whatever it is, let him consider diligently and rationally how the exigencies of the case may most completely be met. Let him, at first at any rate, study no other thing but the convenience of those who will use the place. Is it a concert hall that is wanted? What is the shape which has been found to suit best the acoustic necessities of such a structure? How may the largest number of people be most conveniently accommodated, how best supplied with the means of ingress and egress? Or suppose the building to be erected is one which is to contain many separate apartments under one roof. In that case a different set of considerations press upon the architect's attention. What shall be the size of each one of those rooms or courts? How shall they be placed with reference to each other—what provision must be made of antechambers or corridors? How many floors are required? Of the apartments to be provided which should be on the basement, which on the floor above? For absolute convenience, and with no other thing whatsoever in view, how should these matters be ordered?

Now, it is by no means the fact that considerations based thus on the peculiar exigencies of some individual case could be likely to prove a hindrance to him who should have to deal with them. Very far from it. To the true artist the necessities of the case are always a help rather than a hindrance, being indeed to such an one pregnant with suggestions of the extremest value. Take that very instance just considered, of a building which is to comprise under one roof all sorts of chambers or courts of various sizes, and needed for various purposes. Here is one such apartment which, from the nature of the business to be carried on in it, must be constructed so as to afford accommodation to a great number of people at one and the same time. Here is another which, though not liable to be so densely filled as the first, must yet be able on occasion to accommodate a tolerably large number of occupants. Next to it comes a chamber where no such considerable crowd is ever likely to assemble, and which may therefore be of much smaller dimensions. Now, here at once is afforded an amount of guidance to the architect which, if he is wise, he will certainly know how to profit by. The various sizes and shapes of these different apartments, which he is bound to include in his design, will ensure of necessity a certain variation and irregularity of the ground plan, which will prove of the highest suggestive value. The external form of the future building is—except in the matter of height and roof design—in the main determined by the lines of the ground plan, and on it the shapes and sizes of the different masses, and their division into those great blocks, the outline and light and shade of which the eye takes in at a first glance, are altogether dependent. Other constructive necessities there are which would again affect the lines of this plan; corridors, and waiting-rooms, and antechambers would be required, and, likely enough, some central vestibule which should give access to all those great and small apartments which would be grouped around it. Nor would the influence of these necessities of the case stop here. The placing of these chambers or courts so that each may get its due and necessary share of light and air, their relative positions with regard to one another, some of them needing—owing to the nature of the business to be transacted in them—to be close together, others to be far asunder; the very difference of level which may exist in the ground on which the edifice is to stand, its adaptation to those buildings which surround or are contiguous to it, the atmospheric conditions to which its outer walls are destined to be subjected—all these things would to a mind unfettered by conventional prejudices, and candidly prepared to accept the situation with which it finds itself face to face, prove full of guidance of the most inestimable worth.

But then if they are to prove so, the architect, as has been said above, must have his mind unfettered. He must be capable of taking in all the teaching which nature affords him, and the whole history of the architecture of the world besides, and of deriving from such study all the instruction which may by any means be extracted from it. He must neither be wedded to the pinnacles and gargoyles of the Gothic style on the one hand, nor, on the other, enslaved by the fetters of those tyrannical "five orders," which seem chiefly useful for the throwing up of a barricade before the temple of architectural fame, and rendering the road which leads to it an everlasting "no thoroughfare."

That such barricade may be broken down, if we will only listen to the dictates of reason and common sense, there can be no doubt; nor is there any need for us, in contemplating future architectural undertakings, to fall into the despair to which some of our art critics would consign us without mercy. We are not working in the dark in dealing with questions of this sort. We are in a condition to profit by certain architectural experiments made more than two hundred years back, with no view probably to our advantage in this nineteenth century of progress, but none the less valuable as experiments for all that. S. Paul's Cathedral, and that most beautiful fragment of a palace which we call Whitehall, are two structures which, as showing what kind of architecture is best adapted to the peculiar conditions which a London building is subject to, are of simply inestimable value. For what is required of a London building? That its light and shade should be bold and distinct, that the general plan of it should be on a large scale as to its main divisions and masses, and, above all, that the character of its ornamentation, as well as the material of which it is constructed, should be capable of setting smoke and soot entirely at defiance. Now, all these conditions are fulfilled by the buildings indicated above.* The main outline and design of both are taken in by the eye at a single glance. They possess all the dignity which belongs to whatever is conceived in accordance with the dictates of reason and common sense. No considerations of convenience and usefulness are sacrificed to architectural whims and crotchets. No dilettante obsoletism of fantastic gables, of inexcusable gargoyles, or unpardonable pinnacles is here to weary and aggravate the rational passer-by. What can be urged against this style, or some such modification of it as modern requirements may suggest? What that we need in a building which is to be available for nineteenth century purposes is there with which this style is not compatible? There is no kind of architecture so reasonable in all points, nor any that leaves so large a margin for the meeting of those various requirements which every architect has to deal with in fulfilling the injunctions of his employers. The laws which regulate this school are few and elastic, and permit an immeasurably greater license than those of either the strictly Classical or the Gothic styles. The main shapes and masses of a structure built in conformity with these laws are square and simple; they lend themselves to great prolongation of extent and variety of form, and admit consequently of the construction of rooms of all sizes and shapes that can possibly be required. The doorways in a Palladian building are large and imposing, and the windows are of great size; they admit floods of light into the rooms which they illuminate; they are adapted to modern glazing, and are unobstructed by any of those irrational blocks of masonry which are essential elements, as are also the smallest of window-panes, of the Gothic school. The ornamentation, again, which belongs to this Palladian style is simple and free from whimsicality, and a considerable extension of its resources might safely be ventured on by an architect possessed of judgment and discretion, as well as a fair share of fancy and imagination. In short, a building might be constructed in accordance with the principles of this school, liberally interpreted, which should be altogether impregnable. Whitehall itself—an example which, by reason of its non-ecclesiastical character, is more generally available than S. Paul's—is thus impregnable. Its large plain surfaces undisfigured by any eccentricities of ornamentation, and yet in nowise bare and inornate, its comprehensiveness of design, everything about it, even to the very stone of which it is built, and which the inevitable black smears of London soot altogether fail to disfigure, seem to be in strict accord with the soundest principles of constructive art, and with the lessons incalculated by that "one school" which is "kept by Nature."

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* From an article entitled "The True School for Architects," in the last number of *Fraser's Magazine*. Possibly the writer thinks he is telling the world something new; if so, he is mistaken, as the same principle has been advocated and inserted on dozens of times in the architectural papers.

* Our contributor's admiration for S. Paul's has a little run away with him here.—Ed. *Fraser's Magazine.*

The knowledge to be acquired by means of a diligent course of study in that one school, and by an unflinching adherence to the dictates of common sense, was set forth at the beginning of this article as the only one infallible source of guidance to which we may trust ourselves at all times without doubt or hesitation. Let us now ask to what practical results have the brief reflections into which we have have been led, while following out this simple theory, guided us? Chiefly, and above all, we have found that the attainment of perfect convenience, and the fulfilment of its special purpose, is the first and paramount object to be considered in the construction of any building, great or small, and that to this all things whatsoever are to be sacrificed; that the inside of the structure being thus designed with an eye to convenience, the outside should follow it, and be influenced by it in all its main shapes and outlines, a course which, if courageously persevered in, and tempered with judgment and good taste, would be likely to lead to the creation of a noble design, on which might be engrafted such ornamentation as the artist might see fit to introduce; that all such decorative matter, and, indeed, all decorative matter, of whatever sort, should be subordinate to the general usefulness and fitness of the building to be decorated, and should in no wise interfere with those great first principles of its being, and that such decoration should be specially adapted to the atmospheric and other conditions to which the edifice must necessarily be subject. Descending from general principles to matters of detail, it has appeared that the conditions insisted on above are not fulfilled by buildings in what is called the Gothic style, many of the essential elements of which are incompatible with modern requirements, and are opposed in most particulars to what common sense and a regard to convenience point out as desirable; besides that, there belongs to it a certain quaintness and grotesqueness which, natural and in character with the age when that style was first developed, savour, when revived in this very different period of society, of affectation and wilful eccentricity. Lastly, it has appeared that the style which is called Italian or Palladian, or some modification of that style, is best suited to the requirements of a London building, being exceedingly beautiful both in general structure and in detail of ornamentation, and being capable of setting at defiance the dirt and smoke of the English metropolis.

Before concluding, it would be wrong to omit the mention of certain of our most recent architectectural doings, which appear to have been designed to a great extent in harmony with the principles on the soundness of which it has been the object of the writer of this article to insist. Among the last great buildings which have been erected here in London, those which have of late sprung into existence at South Kensington afford a very valuable indication of the temper of the time. These—and this is especially the case with the Albert Hall—have certainly been constructed on that one sound theory of the beauty of fitness, of which, as has been said above, we see so many illustrations in nature, and which can hardly be trusted too implicitly or too far. The Albert Hall has been built in accordance with all the newest lights in connection with acoustics and optics which modern ingenuity has struck out, the object having been to build a room or hall in which the greatest number of people possible should be able to see and to hear perfectly. The shape and proportion of the hall being thus decided on, its outer walls were properly regarded as a mere external case, to afford shelter and protection to what was within, and were built so as simply to follow the lines of the interior structure. The result has been the production of a building which is simple and dignified, and which, but for a certain need of economy, might have been exceedingly beautiful. The dome, however, is not happy.

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THE SCOPE OF ARCHITECTURAL PRACTICE.

ON the 2nd of October last the first meeting of the 25th session of the Liverpool Architectural Society was held, when Mr. T. D. Barry, President, delivered an address. Among other matters he dwelt on the scientific knowledge it was essential an architect should possess.

Scientific knowledge, said Mr. **Barry**, has now become a necessity in every artistic and constructive pursuit, and those who aim at a high standard must not lag behind in this respect. The late Professor Whewell, referring to the contrast between theoretical and practical work, said in one of his lectures:—

"Looking at the progress of art and science in past times, we find in general that art has preceded science. Men executed great works before they had a scientific insight into the principles on which the success of their labours was founded. There were good artificers in metal before the principles of chemistry were known. Mighty masses were raised into the air before there was a theory of the mechanical powers. The earlier generations did—the later explained how it had been possible to do so—art was the mother of science; the comely mother of a daughter of far loftier and serener beauty."

"Stimulated by the sight of such massive works of human skill—stimulated still more by the natural working of those powers of man from which such skill had arisen—men were led to seek for science as well as art—for science as the natural complement of art, and fulfilment of the thoughts and hopes which art excites—for science is the fully developed blossom, of which art is the wonderfully involved bud."

In this address I am led in some measure to deviate from what has frequently been customary among those who have from time to time spoken from this chair, and it has been partly because the great works of the past, as well as those of more recent date, have frequently and with great ability been described and criticised, leaving me but little ground to travel, and partly because I feel strongly, that, in the increasing importance of the architectural profession in this country and abroad, we must look for a fuller development of the art and science of the profession in the rising generation of its members.

It is perfectly true that the members of the profession in times past have shown no lack of the genius to invent, the patience to persevere, and the zeal and enthusiasm to overcome all the difficulties which occurred in the execution of their many important works; we know this, and we are justly proud of their successes; yet still I feel that as the importance and magnitude of the work is steadily advancing, so will it be necessary for the rising generation of architects to be educated to the evident necessities of the case.

Scientific education is made a special object in all the great schools and colleges on the Continent, and although at the present time many great facilities for scientific study have been opened up in this country, I scarcely think that the opportunities have been fully appreciated. I do not fear, nor have I ever feared, that the art workers of this country would prove unequal to any demands which may be laid upon them, but if they are to rise to this position, they must not neglect the daily increasing opportunities of scientific information on all subjects connected with their avocation.

Not long since, at an art exhibition, I heard a remark from Lord Granville which exactly illustrates what I wish to convey; he said "There was an old lady being driven down Piccadilly one day when the thoroughfare was much crowded, and the horses of her carriage, being very spirited, were going along at a quick pace, so she pulled the check string, and said to her coachman, 'John, are you not driving too fast?' John answered, 'There's no fear, ma'am;' to which she replied, 'There you are wrong, John; there may be no danger, but there's a great deal of fear!"

It is from these considerations that I would urge it as a special duty upon our young members to take good heed that the honourable and high position achieved and maintained by those who have gone before them should not in an age of still greater responsibilities suffer any declension in those who follow.

In order to give a practical turn to these remarks, and to bring them more prominently before the younger members, I would draw a short outline of the nature of such works as usually fall within the scope of architectural practice, or within the customary experience of those engaged in the art of building:

1. Warehouses for the storage of goods.
2. Public offices, railway stations, and buildings representing commercial enterprise.
3. Mansions and dwelling houses.
4. Bridges, quay walls, and works where special precautions have to be taken against injury by the action of water.
5. Works of sewerage and other underground constructions.
6. Churches and places of worship, including school buildings.

Of course these form but a very few of the various classes of building, but they are sufficient to point out one important fact, that the choice of materials to be used in these works should be a matter of special consideration, that each class of material should not only be good as to quality, but that it should be suitable to the uses for which it is intended. In the first instance which I have enumerated, where large masses and heavy blocks are employed in the construction, taking, for example, the article of stone, how essential it is to ascertain what quality of stone is best suited to the purpose, and how its structure and beds will prove available for the mode of construction adopted, and the weight it has to sustain; now, it is in such a case that the knowledge of geology proves of incalculable value to the designer, who will, in addition, if he would master his subject, visit the quarry and make himself acquainted with the strata of the stone, and the frequency or absence of loose veins, or other imperfections.

The same remark will hold good with regard to Nos. 2 and 3, where a more delicate material would be appropriate, and where ornamentation to a greater or less extent would be required.

In the case enumerated under No. 4, a different class of material would have to be selected, with especial reference to the locality in which it is to be used.

Another important material to be understood is brick; its quality, form, strength, weight, powers of absorption, bond, and general construction; and here, as regards the quality and fitness of the clay, a knowledge of chemistry is of vast importance; and it is worthy of note that even the clay we trample under our feet cannot be brought into proper and intelligent use without the aid of science. And this, I think, gives our young members a useful lesson, namely, that they may never be ashamed to soil their hands in seeking full information, as science without practical experiment will be quite as worthless as practice without scientific knowledge. The kid-gloved section of art workers will never soar above mediocrity, if they even reach so far. The taint which the true artist has to shun is not the stain of honest industrious investigation, but the smallest blot upon the escutcheon of his honour and integrity. Mortar is another material requiring special consideration, and this, too, must be chosen with reference to the conditions and position of the structure in which it is to be employed.

In no article of such general use in building is there such inattention manifested as in the making of mortar, and yet the very life of the structure is dependent upon its component parts, quality, and mode of mixture.

The nature of the lime, the proper quantity of sand suitable to its quality, the removal of the unburnt core, the regulation of the quantity made so as to accord with the day's work, are all to be taken into consideration.

Cement is another material which should be carefully considered, being now so extensively used in our most important works. In this article there is very great competition, and, in consequence, many and serious adulterations take place, so that a proper test should in all cases be applied, so as to prove its strength, the time it takes to set, and the best mode of mixing.

Concrete, also, is one of those artificial foundations which it is necessary to understand thoroughly, both in its preparation and mode of laying down; and when properly deposited it forms a most valuable and immoveable support where the natural soil will not afford it, and not unfrequently when the excavated ground is too soft to be trusted, a good foundation of this material may be obtained by laying it on the surface, taking advantage of the grass where no better support can be found.

Puddle is another valuable material requiring care and investigation as to its properties and mode of preparation. In all cases where the action of water has to be guarded against, it is a necessity, and this being the case it is worthy of our careful attention. In cases of underground stories in houses, rain-water tanks, trenches formed for the exclusion of running springs, &c., all efficiency depends upon the perfect preparation of the clay, and the mode in which it is deposited and amalgamated. And here I my just observe that in all house drainage, where health and comfort are the chief objects, every drain pipe should not only be jointed, but also entirely surrounded with a thick coating of puddle, which effectually seals the drain, and preserves the soil from contamination by leakage, which under any other circumstances will take place, even through the pipe itself.

The various qualities of timber are, of course, a most necessary study: their structure, bearing properties, fitness for external and internal work, and another element, which is, I fear, too often overlooked, their effect in construction, by adopting variety of colour in the material itself. Often, I think, we miss the mark in seeking for artificial colour and decoration, while we neglect that ready, inexpensive, and enduring variety which can be applied in the construction itself.

These remarks will apply with equal force to other materials, such as brick and stone. If a suitable colour cannot be found in the material let us not attempt to colour it. If bricks cannot be found red enough to produce the strong contrasts at which many architects are now aiming, let us learn to discard rather than to paint them. As I said before, our wisdom consists in accommodating the design to the materials we have at our command; and I am persuaded that the more we keep this point in view the nearer will be our approach to true artistic feeling.

When we see men painting the bricks on the outside of a church tower, inflaming the surface here and there with an artificial colour which can only endure for a year or two, and can never be renewed after the scaffolding has been removed, it is almost time to speak out for our churches. When we see stone surfaces and mouldings, aye even carved work itself, coated over with a dark green ground, and afterwards floriated or bescrolled with misshapen figures, we sigh for a spot on which our aching eyes can rest, some quiescent surface which is a necessary element in every true artistic effect.

If we want colour in our churches let us have good stained glass, and this will impart all the colour that we need for our stonework.

Let us decorate our roofs and ceilings if we will, but let us spare our walls, and most of all our mouldings and carved work, so peculiarly intended, in their form and combination, to produce an effect of light and shade, which by the introduction of colour we entirely sweep away.

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CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE opening meeting of this society for session 1871-72 was held on Friday evening last at Westminster Chambers, when the President, Mr. C. W. Whitaker, read his inaugural address.

After noticing the satisfactory position and prospects of the society, Mr. WHITAKER proceeded to notice matters of more general professional interest. He firstly referred to what he characterised as the greatest effort of engineering enterprise now before the public, viz., the proposed improved communication between this country and the Continent. He then went on to notice some of the more important engineering schemes which will come before Parliament in the ensuing session, and after briefly referring to the proposal for the purchase of the railways by the State, he proceeded to say that there is one branch of the constructive arts that has for ages excited the admiration of all, and has tested the skill and taste of the engineer, perhaps, to a greater extent than that of all the other branches taken collectively, viz., the art of bridge building. He deeply regretted that the day of stone bridges is past. The bold and massive appearance of bridges constructed of this material gives a result that no other material has or can ever hope to attain. Who can view without a pang of horror the abominations called girder bridges? Doubtless the immense weight of superstructure in stone bridges has been the great cause of their failure, the foundations being unable to resist such enormous weights for an indefinite time without settling, but still, it is pretty certain that if the foundation of a stone bridge gives way in time, that the superstructure of a girder bridge will give way in much less time—in fact, a great and simultaneous fall of girder bridges may be looked for. Fortunately, the introduction of steel into bridge building has given us a material capable of standing immense crushing strains. The large bridge now constructing across the Mississippi at S. Louis must be considered as inaugurating a new era. The gigantic arches, of more than 500ft. span, and great height above water-line, are now rapidly being erected. This wonderful bridge is being constructed of what is called "Chrome steel." This steel has given proofs of possessing wonderful strength and evenness of quality, which latter is still more important. It is to be hoped that we shall once more have the arch reinstated as the support of all our viaducts, even if it be of metal. Mr. Whitaker then proceeded to notice at some length the "coal question," repeating a suggestion of Mr. Bramwell's with regard to the development of water power, in order to reduce the consumption of fuel for manufacturing purposes to a minimum. Mr. Bramwell had suggested that when the tide rose and fell great heights in the neighbourhood of large manufacturing districts, such as Bristol or Liverpool, where large natural reservoirs or basins were passed, that a dam should be placed across the entrance to the basin, and then when the tide rose it would be possible, as soon as the sea was a few feet above the water level inside the dam, to pass the water through suitable channels into the basin, the water working in its passage turbines of great capacity; and when the basin was filled and the tide falling, by a proper arrangement of sluices, the same turbines could be made to utilise the power of the water as it escaped through the channels back into the sea. The turbines, it was suggested, should pump water into accumulators, from which it might be delivered at a great pressure into the neighbouring districts, and there utilised in the factories to drive high pressure turbines of small size but great power. This plan has much to recommend it, but it would have much opposition from shipowners and merchants, whose ships would probably require to be locked up or down through the entrance of the basin instead of passing freely at any time; unless, indeed, they entered at high or low water, which, certainly, in the case of Bristol, would be too late to reach the port on that tide. If ever carried out, the working expenses would probably be a minimum, as beyond the renewal of the small-sized but strong distributing pipes, little cost would be incurred. With regard to sanitary matters, Mr. Whitaker briefly noticed Mr. Stansfeld's Public Health Bill. This, though not directly affecting the engineering part of the question, yet he had no doubt that its working will enable works of drainage to be carried out with greater facilities than heretofore. The Act that passed could scarcely be recognised as the Bill which was first introduced—so much of it was lopped off and struck out in order to pass the main principles of the measure. By transferring the sanitary powers from small "sewer authorities" to the guardians of the unions of several parishes, it is hoped that works, the cost of which would fall heavily on one small town or village, may be carried out, and be felt less burthensome if the expense is spread over a large district. It is even further hoped that several unions may act together, and assist each other in carrying out sanitary improvements. One great object gained by the transferring of power to the guardians is that local opposition is lessened and more independent action gained by this arrangement. A local board or sewer authority, being composed of residents in the town or village, even if its members are enlightened enough to see the necessity of sanitary reform they are in nine cases out of ten afraid to act for fear of bringing down the denunciations of their neighbours, who directly anything in the shape of a rate is mentioned set up a howl against the originators of it. With the guardians the case will be altered. There will always be a majority of members from neighbouring villages able to act independently of the popular opposition in the immediate vicinity to be treated for the welfare of any particular district they may think it desirable to improve. From his experience, Mr. Whitaker had no doubt whatever that if the population of this country could be polled, 75 per cent. of them would vote for leaving things as they are. They would rather go on drinking polluted water and breathing a contaminated atmosphere, than encourage the carrying out of sanitary improvements, the cost of which would have to be defrayed by their being taxed to the smallest extent per head per annum. Hence the necessity of the powers being invested in an independent authority, which, while having the requisite local knowledge, is spread over a large area. The opposition of powerful private interests is also a difficulty that will have to be attacked and overcome by future legislation. Witness the Birmingham Sewage Bill of this session. He was not going to say whether the scheme proposed was the best possible or even suitable to the requirements of the town of Birmingham, but had it been the most perfect of schemes it appears that the influence brought to bear in opposition to it would have been sufficient to upset it. Cases like this stultify all legislation for the public good. It is years since the Sanitary Act and the Sewage Utilisation Acts were passed, compelling towns to discharge no more sewage or obnoxious matters into watercourses, and in numerous instances injunctions have been laid on Corporations to restrain them from so doing. But what is the consequence? They are between Scylla and Charybdis. They propose a scheme of irrigation or some other methods of sewage disposal, and up starts some vested interest in opposition, against which the Acts in question are unable to contend, and the result is no end of expense and difficulty, and probably nothing is done. Most of the processes whereby sewage is treated by precipitation, with the view to the manufacture of a solid manure, are doubtless more or less obnoxious and offensive to the neighbourhoods; but, on the other hand, there is no question that a sewage farm can be, and has been, conducted in several instances without causing the slightest nuisance to the neighbourhood. The difficulty is in getting any one to conduct sewage irrigation in a proper manner. Town councils and local boards often spend large sums in engineering works and agricultural operations in preparing land for this treatment, and they find it not only an enormous expense, with no adequate return, but often an intolerable nuisance. Where land can be handed over to an intelligent farmer who knows and appreciates the value of sewage, who believes in it, and desires to make the most of it, it cannot fail to succeed, but where the farmer is not to be obtained, or where Corporations prefer to work the farm themselves, they should obtain the services of an energetic and competent manager, and give him an interest in the work—pay him a small salary, and allow him a percentage of the profits; and if he is up to his work there need be no fear that the operations will not be successful. The champions of irrigation have for many years advocated the passing of sewage over the land in a raw state just as it comes from the drains, but lately it is advised to separate the suspended matter from the liquid, either by precipitation or filtration, and treat the land with the latter only, the matters in solution being those only that are of any value as fertilisers, those in suspension being worse than useless, for they are the obnoxious ingredients that remain on the surface and cause the nuisance which is so often feared. A method of treating town sewage, which is said to result in the purification of the effluent water and the manufacture of a profitable material to be used as cement, has been devised by General Scott, R.E. By mixing certain proportions of lime and clay with the solid parts of sewage he is said to produce a valuable cement, the liquid matter being treated with milk of lime and purified as in Prof. Forbes' phosphate process. Now, this may be a means of getting rid of the solid constituents of sewage, which form a very small percentage of the raw material, and which has never been a matter of much difficulty, but whether it is of any value in improving the properties of the cement—as cement—further than increasing its bulk, is yet to be seen. The purification of the liquid matter with milk of lime has been in operation for some years, and in many instances, but Mr. Whitaker thinks that neither of the divisions of General Scott's process are likely to be generally adopted or extensively used. He had very little confidence in any of the systems as yet proposed for treatment of the solids in town sewage, at the same time throwing away the fluids, by far the most valuable constituents. Certainly, they cannot warrant their being termed processes of sewage utilisation. Irrigation is the only means that has yet been commercially successful when properly carried out, at the same time obtaining a pure effluent water. There are many localities, however, where irrigation is not only inapplicable, but impossible within the limits of any ordinary expenditure. Where this is the case, he could not but think that the best method of sewage purification yet devised (next to irrigation) is that of intermittent filtration over land. Here no attempt at utilisation is professed to be made, though crops have been grown at Merthyr on the land prepared for filtration, and doubtless more will be, but the chief aim of sewage disposal is attained—the purification of the effluent water, and it is a system that may be carried out with little difficulty or expense in almost every locality.

A discussion ensued, in which several members took part, and a vote of thanks having been passed to the President, the proceedings terminated.

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THE DECAY OF STONE.

AT the last ordinary meeting of the Manchester Literary and Philosophical Society, Dr. J. P. Joule, the President, in the chair, Dr. R. Angus Smith said that he, like others, had observed that the particles of stone most liable to be in long contact with rain from town atmospheres, in England, at least, were most subject to decay. Believing the acid to be the cause, he supposed that the endurance of a silicious stone might be somewhat measured by measuring its resistance to acids. He proposed, therefore, to use stronger solutions, and thus to approach to the action of long periods of time. He tried a few specimens in this way, and with most promising results. Pieces of about an inch cube were broken by the fall of a hammer and the number of blows counted. Similar pieces were steeped in weak acid; both sulphuric acid and muriatic were tried, and the latter preferred. The number of blows now necessary was counted. Some sandstones gave way at once and crumbled into sand; some resisted long. Some very dense silicious stone was little affected; it had stood on a bridge unaltered for centuries—in a country place, however. These trials were mere beginnings; he had arranged for a very extensive set of experiments to be made, so as to fix on a standard of comparison, but had not found time yet.

SANITARY WORK AT SANDRINGHAM.

DURING the late illness of the Prince of Wales considerable interest was excited as to the causes which led thereto, and amongst some of the theories advanced was the impurity of the water at Sandringham House, which, it appears, is derived from a well near the house, and is pumped into two tanks, one, over the kitchen, supplying the water used for all culinary purposes and also the coffee-room and offices adjacent; the other cistern situated in the tower and supplying the rest of the establishment, including housemaids' closets, baths, &c., &c. Towards the latter end of last month the London General Water Purifying Company, 157, Strand, received instructions to do what was necessary towards insuring a perfect purification of the water supply. This they effected by fixing their cistern filters to the outlets of the tanks, for which purpose they employed filters capable of filtering from sixteen hundred to two thousand gallons a day, a quantity probably more than will ever be required, and this was effected without any disturbance of the existing pipes or necessitating any alterations to the building. The material used by this company as a filtering medium being solely animal charcoal, which is pronounced by the most eminent chemists and sanitary authorities to be the best known purifier of water, little further anxiety on the subject of the Sandringham water supply need be felt.

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LEAKAGE FROM GAS-MAINS.

DR. CARPENTER, of Croydon, has written to ask whether, at this juncture, when gasmen are striking, colliers demanding shorter hours of labour, and coals continue at famine prices, "men of science" cannot do something to mitigate an evil which is increasing in an alarming ratio—the manner in which the soil of our towns is being saturated with gas by leakage through the iron mains. The subject has on previous occasions been referred to in the columns of the BUILDING NEWS, and it has been pointed out that a thorough system of street subways for the gas and water mains, telegraph wires, &c., is the only probable effectual remedy. Gas and water mains are invariably of cast iron, very heavy and very rigid, and some of them are of very large diameter. Innumerable suggestions have been made and many patents taken out, for joining the pipes, but none of the methods of connection proposed have been found equal in practice to the ordinary method of casting each length of pipe with a socket at one end, into which the slightly tapering end of the next length of pipe fits and is made water or gas tight by having molten lead poured into the interstice. This method, though perhaps the best that can be devised, is but a poor expedient after all, considering the manner in which the pipes themselves are laid. A long length of gas or water main, laid in the ordinary way beneath the roadway of a street, cannot but be subject to varying strains, for it is next to impossible to make the "bed" of a pipe-trench of uniform hardness and rigidity. This is especially the case with the larger sizes of mains, in laying which the earth is cut away from under the socket-joints in order to give the workmen a little room to use their tools, and it is not easily possible to fill in the earth beneath the pipes so as to make the bottom of the trench of uniform density and hardness. This being so, in course of a short time the heavy traffic of our streets causes the mains to subside or "settle" unequally, and the lengths of iron pipe being, as we have said, rigid and unyielding, the joints show themselves to be the weak points, the soft lead with which they are caulked yielding, and causing fissures by which the gas escapes. With the most skilled and conscientious workmen we do not see how our gas mains are to be laid in the usual mode without the results that Dr. Carpenter deplores, for we do not believe it possible for the pipes to be so evenly bedded as to be unaffected at the joints by the heavy traffic of our streets. We do not see that the present joint is capable of any real improvement; in fact, where the pipes are not unequally strained, probably no other joint would answer so well. The great leakage that undoubtedly takes place is not, therefore, due to any defect of the pipes themselves, or to the method in which they are joined, but to the method in which they are *laid*. The only remedy for this, we believe, will be found in the general use of subways for the gas and water mains, such as those beneath Southwark-street, the Holborn Viaduct, Queen Victoria-street, and the Thames Embankment. If we remember rightly, the gas and water companies were at first extremely averse to laying their pipes in these subways, but we believe that they are now fully alive to the advantages which would accrue to themselves and the public were all their principal lines of mains, at any rate, laid in such a method. And independently of the great advantage of easy and constant accessibility to the pipes which the subway system affords, it is worth consideration whether it would not be a truly economical policy to construct a general system of subways for London and other large towns. Undoubtedly such a course would be a great advance considered as a matter of sanitary science, and would prevent the evils which Dr. Carpenter and others have pointed out.

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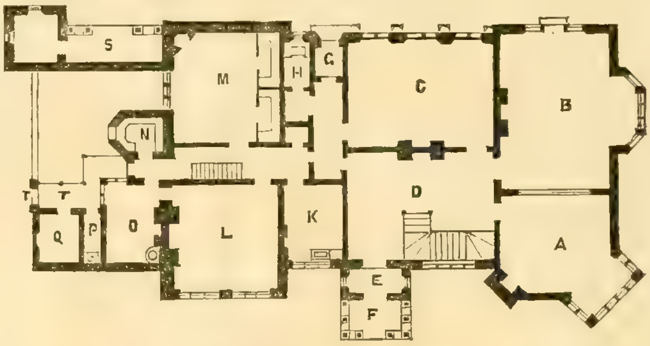
GENTLEMAN'S COUNTRY HOUSE.

OUR illustrations give the garden and entrance fronts of a gentleman's country residence, designed for a Kentish house. Half-timber and weather-tile, as found in old examples in this class of house, is introduced in the construction, the plaster-work between the timbers being in some places pargetted, or "scratched," as it is called in Kent. On the ground-floor there is an open timber porch and an inner porch, leading to a hall 26ft. by 18ft. Leading from the hall are dining, drawing, and morning rooms, and garden entrance, near which is a water-closet and lavatory. The kitchen offices are on the west side, and shut off from the main part of the house. On the first-floor are 14 bedrooms, two dressing-rooms, &c., and in the attic there are bedrooms for servants. Mr. W. Young, of 19, Exeter-hall, is the architect.



GROUND PLAN

Reference to Plan.

A Morning-room.
B Drawing-room.
C Dining-room.
D Hall.
E Porch.
F Outer porch.
G Garden entrance.
H w.-c. and lavatory.
K Butler's pantry.
L Kitchen.
M Servants' room.
N Larder.
O Scullery.
P Servants' w.-c.
Q Coals.
R Kitchen yard.
S Summer-house.
T Covered way to kitchen entrance.

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REMARKABLE WELLS IN LONDON.

THE following particulars of some of the most remarkable wells in London are abstracted from the lately published revised edition of Mr. Samuel Hughes' "Treatise on Waterworks:"—

The well at Meux's Brewery at the corner of Tottenham-court-road and Oxford-street is 343ft. deep, the present ordinary water level being about 198ft. below the surface of the ground. On one occasion when the pumps were stopped for some days five years ago, the water rose 6ft. above this level, but it has never since been so high. At a depth of 209ft. from the surface several adits about 5½ft. high by 4½ft. wide have been driven in various directions. The entire length of these adits is about 500ft., and as the water always stands above them, they form a reservoir of considerable capacity. The well at Courage & Donaldson's Brewery, Horsleydown, is 350ft. deep. It was sunk in 1859-60 by Messrs. Easton & Amos. It has two sets of pumps, each set capable of throwing about 120 gallons per minute. At Webb's Mineral Water Works, Islington, there is a well 225ft. deep. The level of the water in the bore-hole of this well sunk about 15ft. some years ago, upon the sinking of another deep well at the Pentonville Prison. Mr. Webb, however, spiritedly sunk his bore-hole 100ft. deeper, and obtained a plentiful supply of water, which now never sinks below 155ft. from the surface. The site of the well at the Bow Brewery is close to the Lea, and is bored to a depth of 300ft.; the water is slightly tinged with a milky colour when first pumped, but becomes perfectly clear after standing. A still greater depth is reached in the well at Trafalgar-square—viz., 384ft., the boring penetrating 143ft. into the chalk. The water now stands about 108ft. below the surface of the ground, and the well yields 65 cubic feet per minute, or more than 580,000 gallons in 24 hours. The bore-hole of the well at the Bank of England reaches to 307ft. below the surface of the ground, the depth to the chalk being 207ft. In 1869 the water level stood at 74ft. below Trinity high-water mark, having decreased 13ft. during the last 17 years. The level is usually lowest in August, and stands 10ft. higher in January than in the first-named month of each year. The well at the Royal Horticultural Gardens, South Kensington, is 401ft. deep. The water stands about 109ft. below the surface, or 129ft. above the base of the London clay. This well was sunk by Messrs. Easton & Amos, who guaranteed a supply of 75 gallons a minute, or about 108,000 in 24 hours. Not only is this quantity available, but it is stated that a million gallons per day might be drawn if larger pumps and a more powerful engine were employed. The well at Guy's Hospital reaches a depth of 298½ft., that at Whitbread's Brewery, in Chiswell-street, to 408ft., yielding 3,780 gallons per hour. Another at the Lion Brewery, in Lambeth, is also 408ft. deep. It was sunk in 1837 at a cost of about £1,200, and yields 72,000 gallons per day. Messrs. Reid's well in Liquorpond-street is 222½ft. in depth. The well in Kensington Gardens, sunk for the purpose of supplying the Serpentine when the Bayswater Brook, owing to the admixture of sewage, becomes too offensive for the purpose, is 321ft. deep, and the water rises to within 105ft. of the surface. The Amwell-hill well, near the source of the New River, is sunk entirely in the chalk to a depth of 161ft., and in 1852 yielded 2,466,000 gallons per day. The Cheshunt well of the New River Company, 171ft. deep, supplies 702,000 gallons daily. Sir Henry Meux's well, at Cheshunt, is sunk 71ft. deep, with borings in the bottom extending to a depth of 202½ft. from the surface. The well at Crossness, from which it was hoped a sufficient supply of water might be obtained for condensation into steam for the large pumping engines employed by the Metropolitan Board of Works, reaches a total depth of 961ft. The present bore-hole has not penetrated the gault by 60ft. or 70ft. Below this depth the lower greensand would probably be reached, so that the continuance of the boring for another 100ft. would probably have resulted in an abundant supply of water, which has, as yet, not been obtained. The Crystal Palace well, sunk in 1853—55, reaches a depth of 550ft. The main supply of water is, however, derived from the sand spring which occurs at the depth of 259ft., and very little addition to this was gained by the deeper boring into the chalk. In the well at the Coldbath-fields Prison, sunk in 1866-7 by Messrs. Baker & Sons, the chalk is reached at a depth of 132ft., and yields a supply of 216,000 gallons in the 24 hours. Several other wells have been successfully sunk in and near London by the same firm.

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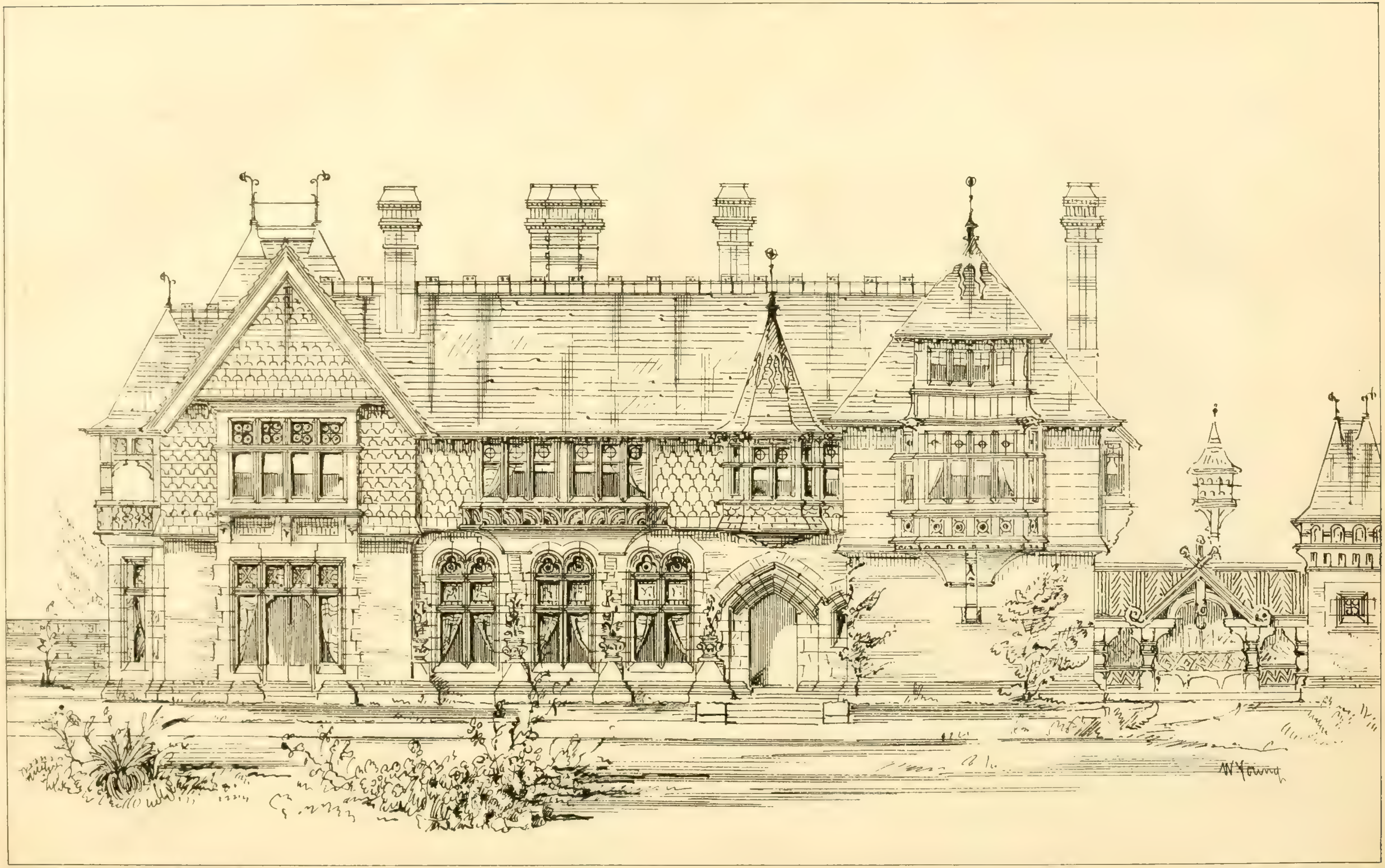
COLCHESTER.—The new schools for S. John's district, Colchester, were formally opened on Thursday by the Bishop of Rochester. The schools were erected by, and from the design of, Mr. Joseph Grimes, builder, Northgate-street, and the cost is about £350.

THEATRES IN EUROPE.—A Berlin paper gives the following statistics of the number of theatres in Europe:—Italy, 348; France, 337; Germany, 191; Spain, 168; Austria, 152; England, 150; Russia, 44; Belgium, 34; Holland, 23; Switzerland, 20; Portugal, 16; Sweden, 10; Denmark, 10; Greece, 4; Turkey, 4; Roumania, 3; Swabia, 1. In Egypt there are three theatres.



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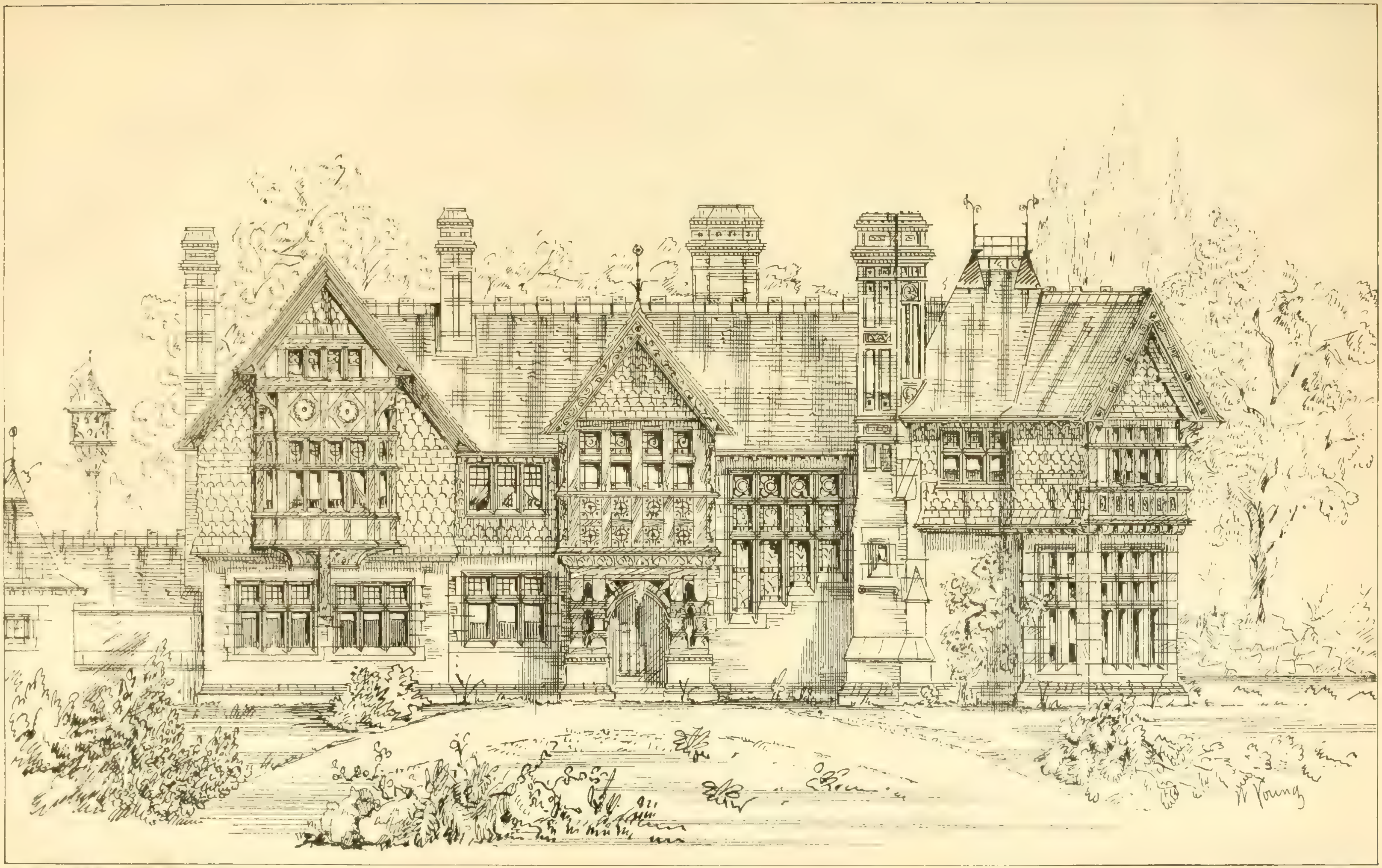
COUNTRY HOUSE, GARDEN FRONT.

W. YOUNG, ARCHITECT.



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COUNTRY HOUSE, CARRIAGE FRONT.
W. YOUNG. ARCHITECT.

AGRICULTURAL PRODUCE, LAND, AND RENT.

ON Monday evening, Mr. W. Sturge read a paper "on Statistical Notes on the Prices of Agricultural Produce, Labour, and Rent, from the early part of last century to the present time," at the Institution of Surveyors, Great George-street, Westminster; Mr. Clifton (the president) in the chair.

In the course of his paper, Mr. STURGE said that it was much to be regretted that statistics of prices prior to the commencement of the present century are very incomplete, and must be collected from various authorities. The average price of wheat from 1700 to 1800 was 41s. 8d. per quarter, the lowest average being 32s. 7d., from 1740 to 1749, and the highest average being 56s. 1d., from 1790 to 1799. The lowest price in any one year was 22s. 9d. in 1744, and the highest price was 76s. 6d. in 1796. The average price of wheat from 1800 to 1871, was 62s. per quarter, the lowest average being 50s. 4d., from 1857 to 1863, and the highest average being 88s. 8d. from 1810 to 1819. The highest price in any one year was 122s. 1d. in 1812, and the lowest price was 38s. 6d. in 1851. Taking the period of 40 years from 1831 to 1871, the average price was 54s. per quarter. The leading fact to be deduced from these tables is that the average price of wheat advanced from 41s. 8d.; the average for the last century to 62s.; the average for the last 71 years, or about 50 per cent.; and to 54s. for the last 40 years, or about 30 per cent.; and this, notwithstanding the fact that, from 1700 to 1754, England was an exporting country, under the stimulus of a bounty on the exportation of corn, and that, on the contrary, enormous importations have for many years been required to feed her increasing population. Relative to barley and oats, no statistical tables of their prices have come to hand prior to 1791. In the "Landholder's Companion," published by Mr. William Allen, in 1734, 20s. per quarter is quoted for barley; and Arthur Young, writing in 1771, bases some estimates on 24s. per quarter. The former writer quotes 12s. per quarter as the price of oats, and the later 18s. The highest average price of barley was 45s. 8d. per quarter from 1810 to 1819, and the lowest 31s. 6d. from 1850 to 1856, and the average of the last 71 years 35s. 9d. The highest average price of oats was 30s. 4d. per quarter from 1810 to 1819, and the lowest 20s. 6d. from 1843 to 1849, and the average of the last 71 years, 24s. 3d. The general result may be stated to be, that in the course of a century the price of barley has advanced from 24s. to 35s. per quarter, or 46 per cent., and that of oats has advanced from 18s. per quarter to 24s., or 33 per cent. Statistical information on the prices of beef during the last century is scanty and incomplete. The prices of beef per stone of 8lb. from 1740 to 1748 was 1s. 6¾d.; 1749 to 1754, 1s. 5½d.; 1755 to 1762, 1s. 7d.; 1763 to 1774, 1s. 8½d.; 1775 to 1782, 2s. 0½d.; 1783 to 1792, 2s. 0¼d. The fluctuations in particular years as to the price of meat, dating from 1790, is as follows. The lowest quoted price in 1790 was per stone 2s. 6d.; the highest during the war, 1814, 6s. 4d.; the lowest since the war, 1823, 3s. 2d.; the lowest during the agricultural depression which followed the repeal of the Corn Laws, 1850, 3s. 6d.; the present price, medium quality, 5s. 1d.; prime quality being 6s. 3d. These figures show a rise between 1790 and 1814 of 150 per cent.; a fall, 1811—1823 of 50 per cent.; a rise, 1850—1872, medium quality 45 per cent., prime quality 65 per cent. The greater rise in the price of prime, as compared with middling and inferior meat, in the last 20 years, shows an increased demand for meat of prime quality. The price of stock, on a long series of years, may be assumed to fluctuate in proportion to that of beef and mutton. The prices of stock are so various, according to size and quality, and statistics are so scanty, that it is difficult to obtain much reliable information as to the past; but judging from the present price of stock, the increase in value in the course of the century from 1770 to 1870, may be roughly estimated at 150 per cent. Cheese has advanced in the century from 29s. 6d. to 68s. per cwt., or 125 per cent.; and butter advanced during the same period from 6½d. to 1s. 4d. per lb., or 133 per cent. The highest price of cheese quoted during the present century was 77s. 8d. per cwt. in the years 1813 and 1814; and the lowest price was 51s. 4d. in 1852. The advance in the price of cheese from that date to 1870 is about 33 per cent., and that of butter about 45 per cent. In regard to labour, Mr. Allen, writing in 1734, tells us that "harvest people and servants had then become much dearer then heretofore;" and Arthur Young, writing in 1772, publishes a table of the wages current in most of the southern counties at different seasons of the year, which table shows great fluctuations between different parts of the country. He prepares an abstract showing the average wages paid during the whole year, at various distances from London, including an estimate of the value of victuals and drink supplied. Wages probably reached their maximum in the years of high war prices, from 1803 to 1815. A great fall took place concurrently with the decline of prices, which commenced soon after the peace of 1815, and reached its lowest price in 1822. In the 20 years from 1850 to 1870 a rise took place of 1s. to 2s. per week. The result of the recent agitation has probably been to establish a further general rise of 1s. to 2s. per week. Statistics of the fluctuations of rent are more difficult to obtain than those of the prices of produce, and it is almost impossible to obtain accurate *data* for comparison on a sufficiently large scale for reliable average results. There is a rise of three to four fold in a period of 40 years. In the 23 years ending 1794, during which there was no great increase in the price of produce, there was a gradual advance in rent. In 20 years, from 1795 to 1815, when a range of high prices of all kinds of agricultural produce prevailed, consequent on the French war, and (during a great part of the time) an inconvertible paper currency, there was an advance in rent of land. In seven years, from 1816 to 1822, during which prices rapidly fell, notwithstanding a Corn Law intended to maintain wheat at 80s. per quarter, it gradually advanced. This relapse, consequent on the exhaustion caused by the long war and the resumption of cash payments, reached its culminating point in 1822, when the price of produce fell fully 50 per cent. below its maximum 10 years before. This was a period of great agricultural distress. Landlords struggled to maintain their advanced rents; tenants were unable to pay them. Therefore, the fall of rent from its war maximum may be estimated at about 33 per cent. In 26 years, from 1823 to 1848, exhibiting a gradual recovery in the prosperity of the country and in the prices of produce, there was a recovery of (say) 10 per cent. in rent. In four years, from 1849 to 1852, exhibiting a very low range of prices of all articles of agricultural produce, consequent on the repeal of the Corn Laws, rents were generally reduced about 10 per cent. In some cases landowners were obliged to submit to a reduction of 15 to 20 per cent. Twenty years, from 1852 to 1872, during which an unexampled extension has taken place in trade and manufacture, and the consumption of all kinds of agricultural produce has enormously increased. The price of corn has been kept down to nearly its previous average by foreign competition, but the prices of meat, stock, and dairy produce, have advanced upwards of 50 per cent. The rent of dairy, grazing, and stock farms has advanced 33 per cent., and is now as high as it was during the French war. The rent of arable farms has advanced 10 to 20 per cent., but it has not generally reached the maximum attained during the war; nor is this surprising when we recollect that during the 20 years from 1800 to 1819, the price of wheat ruled more than 50 per cent. higher than it has ruled during the last 20 years. The present high prices of meat and dairy produce are no doubt mainly due to the increase of the population and to the greatly increased consumption of the working classes, and also, though in a less degree, to decreased production, caused by the droughts of 1868 and 1870.

A discussion followed, and votes of thanks to Mr. Sturge and the chairman closed the proceedings.

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CONCRETE BUILDINGS AT ROSSIE PRIORY, PERTHSHIRE.

THE recent revival of the ancient art of concrete building is attracting the increased attention of builders and others to a considerable extent.

Lord Kinnaird has built one house and a considerable addition to another at Castlehill by this process. Satisfied with the superior advantages and comparative cheapness of the system, his lordship is building a handsome new parsonage for the chaplain at the Knap, situated within the policies, near the Mill Hill Lodge. The building is of two stories, with five gables in cottage style, containing dining-room, with three-light window; drawing room, with bow-window; four principal bed-rooms, some of them with two windows; bath-room, kitchen, sculleries, and other conveniences. The structure, which presents a very pleasing and interesting appearance, and seems to fit well with the surroundings, was designed by his lordship's surveyor and clerk of works, Mr. Duncan D. Stewart, who superintended the labourers employed, these being occasionally assisted by one of his lordship's joiners, who fixed and refixed the apparatus. The materials used were stones and refuse from the stonebreaker, and in upper story ten loads of engine ashes were used. The walls up to the first joists are one foot thick, and the second story nine inches. The following statement, furnished us by Mr. Stewart, of cost of concrete building of the parsonage when 10ft. high from the bottom of the average depth of foundation, may be of interest, as showing the same in comparison with the same amount of stone masonry:—

CONCRETE.—Measurement of main division and partition wall 18, 12, 9 and 6 inches thick, reduced to a standard of 12in. thick, voids deducted—130 superficial yards. Expenditure:—

Cement used, 4½ tons, at 50s.; used in proportion of 8 of small material to 1 of cement ...	£11	5	0
Labour 37 days, at 2s. 6d. ...	4	12	6
Extra for foreman ...	0	2	6
Joiner for framing, &c., four days, at 4s.	0	16	0
	£16	16	0

£16 16s. divided by 130 gives 2s. 7d. as the cost of 1 yard superficial for cement and labour; or, for comparison, £4 13s. per rood of 36 square yards. Materials used in 130 yards superficial of concrete wall 1ft. thick are 32 loads small material, 14 loads larger material for packing.

MASONRY.—In measurement of masonry, no voids under 8ft. in width are deducted to allow for plumbing, semi-lions, and sides, &c., but all deducted in this case. Measurement as before, 130 superficial yards in walls 22in. thick:—

130 yards nearly equal, 3⅗ roods of 36 square yards, 3⅗ roods, labour only, at £6 5s....	£22	18	10
Cost of concrete ...	16	16	0
Balance in favour of concrete in labour alone	£6	2	10

The above does not include cost of materials nor cartages In order, therefore, to show the difference or quantity of materials, I will take the cartage and put in a price similar to both.

CONCRETE.—Labour only ...	£16	16	0
32 loads small material, at 1s. ...	1	12	0
14 loads larger, at 1s. ...	0	14	0
	£19	2	0
4½ tons cement from station ...	0	18	0
Concrete—Total labour and cartages ...	£20	0	0
Masonry—22in. thick—3⅗ roods, 87 loads, at 1s.	4	7	0
3½ tons lime from station, 4s. ...	0	14	0
28 loads of sand, 1s....	1	8	0
Cost of labour only ...	22	18	0
Masonry—Total cost ...	£29	7	0

Cartages, of course, vary according to distance.

The cost of concrete for labour only and cement, 2s. 7d. per yard.

The cost of masonry, labour, and lime only, 3s. 6d. per yard.

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ON THE ORNAMENT CASTS IN THE ARCHITECTURAL MUSEUM.

LECTURE IV.

MR. BRINDLEY delivered his fourth and concluding lecture on the 23rd ult., taking the Decorated and Perpendicular (Second or Middle and Third Pointed) periods. He said that the ornamental foliage he had treated of up to this period of Gothic architecture had been more or less conventionalised, and, judging from the examples of Early English examined at the close of the preceding lecture, there was not much fear in saying the old men had proceeded in conventionalism as far as they could go. In his opinion their ornament was perfection, and he should as soon think of a modern sculptor trying to improve on Greek sculpture, as of a modern carver trying to surpass the old men in Early English. His advice to carvers, then, was this: If you have Early English work to do don't be above copying; and if you want good examples to copy come to this Museum. It was at the commencement of the thirteenth century as it is now—they were not satisfied, so they had a change, and that in ornament, as great as it well could be, for all attempts at conventionalism they now threw overboard, and went in for copying nature as closely as they could. The foliage of their capitals, arch mouldings, groin bosses, spandrels, diapers, crockets, and finials, was all natural, copied with the greatest care, and it had no pretension to be anything else. The nearer it is to nature the more perfect it is. They carved leaves both as seen on front and back, but generally gave the preference to leaves as seen on the back, for the backs being convex, gave them bright light against their deep shadows. He then proceeded to show how they adapted natural foliage, beginning with crockets, for wherever these are used there is no difficulty in telling the style. The crockets in the last style, Early English, all turned over, and the finials consisted of four of these crockets, supporting a globe or holy vessel. We now found a great change, for the crockets were natural leaves, applied as creepers, and generally seen in profile, and in this outline they introduced a great number of varieties of leaves, such as thorn, mugwort, maple, wild ranunculas, oak, and various others. He then proceeded to compare, by sketches on the black board, the crockets of the Early English period with those of the Late Decorated and Perpendicular styles. The capitals of this date, like those of the preceding period, are of similar good proportions, the abacus being of the same plan as the arch mouldings they have to carry, which generally is circular. The foliage usually projects as much as the abacas, but sometimes less, and mostly is carved on the surface of the material left, the arrangement of the leaves being frequently geometrical, so that the points and edges of the leaves touch, and at the time you are admiring the foliage you see the architectural growth right through. Another method is by breaking up the mass of material into bunches or sprigs of foliage, of which there are a few excellent examples in the transept of Westminster Abbey, and the Chapter House, Southwell, of which there are casts. In the bunching of this foliage it was noticeable how cleverly the back and front of leaves were used, the back giving bright light, the hollow front of leaf half tone, so to speak, and to keep the round of nature in the hollow leaves, a bunch of flowers or seeds was frequently introduced; the bell, as in the previous case, is well developed, and leaves are placed on it in low relief, and, as in nature, of various sizes, so that the whole has a marvellously life-like effect.

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ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Nottingham Architectural Association.—A paper was read by Mr. F. Bakewell, on Friday evening, November 29, before this Association, entitled "A Few Days in Belgium." The author gave a brief description of a visit paid in the summer of this year to Bruges, Ghent, Ypres, Coutrai, Tournay, Mons, Brussels, Louvain, Malines, and Antwerp, illustrated by a plan of Bruges, plans of Tournay and Antwerp Cathedrals, and upwards of forty photographs of the principal buildings of interest in those cities and towns. Commencing with a short allusion to Ostend, and a somewhat amusing incident there, Mr. Bakewell proceeded to review the more prominent features of Bruges, examining its plan and the arrangement and forms of its streets and squares, and pointing out the great charm of its almost unchanged Mediævalism, and the quaintness and picturesqueness of its structures. He then passed on to consider the buildings of Bruges under these two heads of religious and civic structures, describing briefly the Cathedral, the Church of Notre Dame, Hospital of S. John, the double chapel of S. Sang, with its two rather curious turrets; the Hotel de Ville, and more minutely, and somewhat at large, the Great Hall, with its lofty and picturesque tower or belfry. Speaking of the belfry of Bruges and that of Ghent, he called attention to the privileges attaching to the possession of a bell, introducing the following quotations from Fergusson:—"The right of possessing a bell was one of the first privileges granted in all old charters, not only as a symbol of power but as the instrument for calling the community together, either with arms in their hands to defend their walls, to repress internal tumults, for the election of magistrates, or deliberations on the affairs of the commonwealth." The tower on which the bell was hung was a symbol of power in all ages, and whether on the Schelde or the Po, the first care of every enfranchised community was to erect a tower of pride "proportionate to their greatness." Some further particulars were then given of other belfries remaining, and those of which records remain. Photographs were exhibited of some of the more interesting features of Ghent, and commented upon; one of the Hôtel de Ville at Oudenarde created considerable interest. From Ghent Mr. Bakewell passed to Ypres, describing its walls, magnificent cloth hall, and cathedral. The peculiarities of Tournay Cathedral were then reviewed, with the aid of a plan, photograph, and drawings. Having described the cathedrals at Mons, Louvain, and Malines, the author finished with Antwerp, concluding with these words:—"As the result of the impressions made upon my mind, one was, that interesting as the architecture of Belgium is, it is not quite a success. Certainly, no country has equalled her so far as civic buildings are concerned, and they cannot be too much or too often studied; but the ecclesiastical buildings fail in delicacy of proportion and refinement of detail as compared with those of France and England. It is quite true that many examples of early work are to be found, as at Tournay, Sorgnies, and elsewhere, but they are comparatively few and far apart, and in most cases much marred and altered. It is on buildings of the fourteenth and fifteenth centuries that Belgium puts forth her strength, and upon which she lavished her wealth, certainly with no mean hand; but they lack refinement, and are really more the evidences of wealth freely given than of true religious feeling, and, further, an illustration of the fact that money-making and active commercial enterprise seem incompatible with true art. While France and England were deeply stirred by religious emotions and a love of adventure, the inhabitants of Belgium contented themselves with simpler pursuits and a less exitable life, combined with stern independency of feeling. This, productive indeed of more tangible happiness and solid results, failed to call forth the purest samples of art; and wonder as we may at their marvellous results as seen in the Hôtel de Ville at Louvain and the towers of Antwerp, and the gorgeousness and richness of their monuments and sculpture, they fall into a second place before the glories and exquisite beauties of such works as Amiens and Rheims." At the close of the paper, a discussion took place, in which the President, Mr. T. C. Hine, Mr. Evans, Mr. Tarbotton, Mr. Norris, and others took part. The President, in continuation of some remarks by the author of the paper upon the size of Mediæval bricks, advocated a reduction of the thickness of bricks as productive of a more satisfactory appearance; and Mr. Norris called attention to the value of old English brickwork, and the beauty of the tints of the examples found in the southern part of England. Mr. Tarbotton regretted that Mr. Bakewell had not been able in the limits of his paper to give them more particulars of the brickwork of Bruges, alluding to several fine specimens there. Mr. Evans, after some observations upon the roof of the Hôtel de Ville, moved a vote of thanks to the reader, which was seconded by Mr. Norris.

Royal Archæological Institute.—At the monthly meeting, held on Friday last, a number of articles were exhibited, and notably, the very fine gold torque recently found at Chatham, in the operations of the Royal Engineers. This valuable relic, which weighs 22oz. 4dwt., was shown by permission of the Secretary of State for War, and is of the value of £80. A collection of seventy-eight finger-rings, of dates varying from the third to the eighteenth century, sent by Mr. Fortnum, also attracted much attention. The papers read were, "On the Monumental brasses of Huntingdonshire," by the Rev. Valpy French, D.D.; and "On a Cromlech at Trefigneth, Anglesey," by the Hon. Owen Stanley, M.P., Lord-Lieutenant.

Liverpool Architectural and Archæological Society.—The fourth meeting of the session of this society was held on Wednesday evening, at the Royal Institution, Colquitt-street, Mr. Berry in the chair. A paper was read by Mr. Joseph Boult, on "The Assessment of Railways and Similar Undertakings." Mr. Boult's object was to show the practibility of simplifying the process of arriving at the rateable value of railway and other property of a similar kind. A discussion of a practical character took place; and two members were added to the society.

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SCHOOLS OF ART.

Cheltenham School of Art.—The annual distribution of prizes and certificates took place last week, the chair being occupied by the Rev. T. W. Jex Blake, M.A., President of the Institution, who congratulated the students and their friends upon the improved aspect of affairs since their removal to the more central premises in Clarence Parade.

Edinburgh.—The annual distribution of prizes to the students of the Edinburgh School of Art took place on the 28th ult. The number of students who have attended the Central School of Art in the year 1871-72 is 620, viz., 420 in the male school, and 200 in the female school. In both schools there is a slight decrease in the number of students compared with the number in the previous year. In the schools of the city 1020 students have received drawing instruction from the teachers of the School of Art. These students have been somewhat fewer in number than in the preceding year. The examiners of the male school report that, "The master is to be congratulated on the reassertion of the high position which the school has generally held—a position mainly due to the thoroughness of the study from the antique statue, based upon anatomical analysis and acquaintance with the details of the extremities. Original design is, if not largely, yet successfully pursued, and a sound method of painting in oil inculcated."

Ryde.—The annual *conversazione* and distribution of prizes in connection with the Ryde School of Art was held on Thursday last. The report stated that the donations for the present year amounted to £21 18s. 6d., while the school fees were £128 13s., and the Government grant £61 16s. 6d., making a total of £215 8s. The number of persons in the artisan class at present on the books was 35, but the average attendance of such persons was but sixteen or seventeen at a time. At the examination 35 out of 57 candidates obtained certificates, eight passed in the third grade, and eight in the second, by no means a bad average.

Wolverhampton.—The annual distribution of prizes in connection with the Wolverhampton School of Art took place on Wednesday week. The annual report of the school was read by the schoolmaster (Mr. Gunn). He complained of the indifference of the youths of Wolverhampton to engage in the study of art and science, and maintained that the support given by the wealthy inhabitants of Wolverhampton to that institution was inadequate to render the school as efficient as it otherwise would be. In regard to the progress of the pupils the report spoke in very favourable terms. In the recent Kensington examinations the pupils of the Wolverhampton School of Art had obtained a fair proportion of the prizes. On the whole, it appeared that the school was in a healthier condition than at any previous period of its history.

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COMPETITIONS.

Edinburgh.—Sir Gilbert Scott has, according to the *Scotsman*, been instructed to alter the front of his design for the new cathedral by the addition of a couple of towers of 170ft. to 180ft. high. The rest of the design is to remain untouched. By the proposed addition the cost of the building will be increased by something like £10,000 or £12,000; but it is thought that such a sum will be well spent in imparting to the edifice something more of the dignity and variety which befit a metropolitan cathedral.

Liverpool.—The Sites and Buildings Committee recommend that the Board should adopt the plans of Messrs. Reade & Goodison, and the Board should purchase, subject to the consent of the Education Department, 2,500 yards of the site in Ashfield-street, at 25s. per square yard.

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LEGAL INTELLIGENCE.

Pearson v. Johnson and Smith.—This case was tried at the Nisi Prius Court, Manchester, on Friday, before Mr. Justice Mellor and a special jury. It arose out of an accident at the works of the new Town Hall, in Albert-square, Manchester, the plaintiff, Michael Pearson, having been employed as the driver of the engine of a travelling crane. He brought the action to recover compensation for injuries which, he alleged, were sustained through the negligence of the defendants—the contractors for the erection of the building—or of their servants. On the 25th of January of the present year the plaintiff was in charge of the engine of the machine, which was lifting a large stone. Suddenly, one of the beams on which it rested gave way, and the plaintiff fell with the engine on some stones, about 7ft. or 8ft. lower down. Pearson sustained fractures of both thighs, and he now contended that the beam which broke was rotten, and that ought to have been known to the manager of the works, and, in consequence, he claimed compensation.—Mr. Holker, Q.C., and Mr. Cottingham, appeared for the plaintiff; Mr. Pope, Q.C., and Mr. Ambrose, for the defendants.—Evidence was given by the plaintiff and others to substantiate the opening statement of Mr. Holker.—Mr. Chatwood, C.E., Manchester, said his opinion was that the accident occurred through a defect in the timber. If the beam had been sound, the fracture could not have taken place, supposing the tie-rods had remained intact. If there was a jerk sufficient to loosen the tie-rod and allow the beam to fall, that might account for the accident, but the sudden putting in motion of both parts of the engine could not have caused it.—Mr. Evan Leigh, C.E., Manchester, said he agreed with Mr. Chatwood's evidence. The machine ought not to have been worked, as it was without a tie-rod.—Mr. Gordon, house-surgeon to the Royal Infirmary, said that the plaintiff would not be able to resume his occupation for six months, and one of his legs would be permanently shortened.—This concluded the plaintiff's evidence, and Mr. Pope submitted there was no case. There was no evidence of any defect in the beam being known to anybody. But, even supposing there should be evidence of the fact, Mr. Mackie, the manager, was not in the place of the masters, but merely a fellow-servant of the plaintiff.—The Judge said that if Mr. Mackie had complete control, and had power to engage or dismiss workmen, he thought he would be in the condition of the master. He should not stop the action, but should give leave to move, if wished, in the Court above.—After the adjournment of the Court for luncheon, Mr. Pope said he did not mean to contest the mere facts of the case. There was no doubt that the crane was used for some little time without one of the tie-rods. He, therefore, proposed to put Mr. Mackie and Mr. Edmunds (foreman of the masons) into the witness-box, to state what their position was.—These witnesses having been examined, it was agreed, after some discussion, to leave the question of damages to be formally assessed by the jury, with leave for the defendants to move in the court above to set aside the verdict.—The jury assessed the damages at £500.

Building Intelligence.

CHURCHES AND CHAPELS.

CITY.—On Advent Sunday the church of S. Peter-upon-Cornhill was reopened after extensive repairs and improvements, which have been carried out under the superintendence of Mr. John Drayton Wyatt, of Gloucester House, Liverpool-road. The church is in some respects one of singular interest. As is well known, there is an old tradition that it was founded by Lucius, the first Christian King of Britain, in the year A.D 179, and that it had originally the *cathedra* of the Metropolitan. The church was destroyed in the great fire, and it was rebuilt after designs substantially furnished by Sir Christopher Wren. The rector at that time was Bishop Beveridge, and owing to his influences a choir screen was provided, the only one in London except that of Allhallows, Thames-street. It was designed by the daughter of Sir Christopher Wren, and is extant to this day.

DUNBLANE CATHEDRAL.—The restoration of Dunblane Cathedral continues to make satisfactory progress. Sir Gilbert Scott, under whose direction, along with that of Mr. Mathieson, of her Majesty's Board of Works, the work is being conducted, visited the Cathedral on Tuesday week. Some interesting features of the building have been disclosed by the clearing out of the chancel. The fine doorway in the north wall, communicating between the chancel and the chapel—supposed to have been the Lady Chapel—has been more fully exposed, and there has also been revealed, a few feet to the east of the doorway, an arched recess or niche about 8ft. high and 6ft. wide. This niche is understood to have been the tomb of one of the early bishops. When the chancel was repaired in 1817 it was found necessary to break out a doorway through this niche, and the stone coffin which it contained, and the fine dog-tooth mouldings running round the arch were placed in a corresponding niche in the south wall of the church—made, no doubt, to receive them. These will, of course, now be restored to their original position, and the effect of the tomb and the doorway will contribute very materially to relieve the heavy dead look of the north wall. It was hoped that the tomb of the three Ladies Drummond, who, according to tradition, were poisoned to secure the death of one of them—Lady Margaret—whom James IV. had either married or wished to marry, contrary to the wishes of the Lords in Council, and were buried in Dunblane Cathedral, might be found, and a vault was anxiously looked for by the excavators. All, however, that was found was a few stone coffins, some coins, and a quantity of bones, and it was pretty clear that the floor had been disturbed and thoroughly searched before.

DUNDEE.—The foundation stone of S. Joseph's (Roman) Catholic Church has been laid at Dundee. The plan of the building is cruciform, having nave, transepts, and sanctuary, and the sanctuary is terminated by an octagonal apse. There will be no aisles. The total length of the church, from north to south, will be 147ft. 6in., and the nave, transepts, and sanctuary, are each 40ft. wide. The side walls are 20ft. long, and the apex of the roof is 45ft. from the floor. The total cost of the building will be about £4,000, and it will comfortably seat 1,000 persons. Both externally and internally, the building will be of an unpretentious but substantial character.

HUDDERSFIELD.—On Thursday week the new chapel erected at Paddock, Huddersfield, for the Congregationalists, was opened. The building is in the Gothic style, it has cost £11,000, and there are sittings for 700 persons. The architects are Messrs. John Kirk & Sons, of Huddersfield. In the west end there is a bas-relief, by Mr. Thomas Stocks, representing the "Sermon on the Mount." The building is well lighted and warmed, and is provided with numerous entrances, both to the gallery and the body of the chapel.

MANCHESTER.—On Monday morning the solemn opening of the new Lady Chapel took place at the Church of the Holy Name, Oxford-road, Manchester. The chapel is situated on the Gospel side of the sanctuary, and opens into the transept. The roof is groined in terra-cotta, and the chapel is open at the sides. In the evening the Bishop of Salford blessed the statue on the altar.

READING.—On Wednesday week the memorial stone of the new Wesleyan Methodist Chapel was laid. The architect is Mr. Joseph Morris, and Mr. W. H. Woodroffe the builder. The new chapel will be built in the Early Gothic style, having a tower and spire, 130ft. high, at its north-east corner. The chapel will be 80ft. long by 50ft., and the chancel will be 21ft. by 26ft. The building will contain sittings for 900 persons. At the south-end of the chapel a long school-room will be built, furnishing accommodation for 400 scholars. There will also be an infant school-room, four class-rooms and vestry. The total expenditure, including the purchase of land, will be about £7,000.

SALISBURY CATHEDRAL.—The restoration of the paintings of the choir of this cathedral, valuable specimens of thirteenth century work, has been finished. The pavement of the choir, which is to be a mixture of encaustic tiles of the old pattern and of black and white marble, has been ordered by the Restoration Committee. In addition to the work already completed and in hand, the fittings for the choir, including desks, fronts for stalls, canopies to ditto, pulpit, throne, remodelling of organ, gates, grille work, &c., have still to be provided. The cost of these has been estimated at £8,000, and does not include the reredos and screen, for which provision has been privately made. A lady of the diocese has promised £1,500 towards the canopies to the stalls, estimated at £3,000, on condition that another £1,500 can be raised for the same purpose by Christmas, 1873.

SCHOOLS.

LEICESTER.—At the meeting of the Leicester School Board on the 2nd inst., the Architects' Committee presented a plan which has been prepared by Mr. Goodacre, for a school of four departments, on the site in Slater-street, which they consider a suitable plan for the site, and recommended that the Board forward it to the Education Department for approval. The Committee also presented for the consideration of the Board an elevation, which has been prepared by Mr. Jackson, for the school in Oxford-street. Both recommendations were agreed to.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

It is intended to issue in future, in the First Week of Each Quarter, a "Large Number" of the BUILDING NEWS, with a guaranteed circulation of

Twenty Thousand Copies.

Copies of these numbers will be forwarded to every Architect, Engineer, Builder, Contractor, and Surveyor in the United Kingdom, and to all in America, India, and the Colonies whose addresses can be obtained.

Space will be reserved for a limited number of EXTRA ADVERTISEMENTS, the charge for which will be as follows:

Whole Page........	£12 0 0	Quarter Page.......	£4 0 0
Half Page...........	7 0 0	One-eighth of Page	2 10 0

Small Advertisements One Shilling per line.

Special arrangements may be made for a series of insertions.

The First QUARTERLY LARGE NUMBER will be issued on January 3, 1873, and all advertisements intended for insertion therein should at once be forwarded.

RECEIVED.—C. H.—J. W.—G. E. S.—Sir G. G. S.—J. K. J.—Lord K.—Th. B.—W. B. J.—W. M. & Co.—G. F.—T. P. J.—J. P. S.—E. N.—B. & S.—G. & Co.—A. C.—W. H.—B. S.—Rusticus.—J. P.—W. E. D.—E.

A. B. C.—Twelve postage stamps to hand.

CREO.—Perhaps the design came to hand and was omitted in the list. We will see when going over them again.

J. S.—Of a suitable size, and of good quality paper.

R. CHAMBERLAIN suggests there should be "a competition for a church capable of holding from 700 to 800 people."

J. M. GRANT suggests there should be "a competition for a piece of furniture, such as a side-board, book-case, or writing-case." We think so, too.

RUSTICUS, Cumberland, suggests there should be "a competition for a complete set of farm buildings, house included, which might be divided under two heads—1st, a farm of £150 to £200 per annum; 2nd, a farm of £500 per annum." A good suggestion.

SCHOOL PLANNING COMPETITION.—We hope next week to be enabled to announce that the designs for this competition will be exhibited free at the rooms of the Architectural Association, Conduit-street.

Correspondence.

GRANITE AND MARBLE.

To the Editor of the BUILDING NEWS.

SIR,—I take leave to demur to Mr. Travis' statements in the conclusion of his remarks last week. I do not believe that "the best marble will be destroyed sooner than the best granite," and I am quite certain that, unless under very rare circumstances indeed, marble will not cost ten times as much as granite. In my former note I quoted the evidence of an eye-witness as to the behaviour of granite in the Boston fire. He says, "Most of these great (granite) stones have gone to powder. Meantime, in this wreck of granite, the marble building at what was, as near as I can make out, the corner of Lindall and Congress streets, stands erect, and in structure uninjured. The façade has not a fissure in it." Now, these granite and marble buildings were subjected to the same heat, which was utter destruction to the one and harmless to the other. Of course, Mr. Travis will reply that these granites were of the worst quality, and the marbles of the best quality. I have no data by me to show whether that was so or not, but it cannot be denied that in this particular case, at least, marble stood the test best. But Mr. Travis doubts whether it was marble at all, and suggests lava or basalt. I may tell him that I have seen many of these marble buildings in the cities of the Eastern states, and I do not doubt the material to be pure white marble, large quarries of which exist in New York State and elsewhere nearly equal to Carrara.

Now as to cost, I may say that in the first place it will be impossible to work granite at all in such forms as modern necessities require. As capitals, for instance, I am told those to the columns inside S. George's Hall, Liverpool, are painted shams, whereas if the columns had been marble the capitals also would have been marble. Again, our American brethren do not find marble so costly, but that they can, and do, afford to use it very largely in the fronts and principal rooms of their public and private buildings, and I am quite sure, as a practical man, that our business men in London will not refuse to bear the extra expense, if any, that the use of so excellent a material both for construction and ornament would entail.—I am, &c., E. G.

GRANITE *VERSUS* SANDSTONE.

SIR,—I was much interested with the letter from Mr. H. Travis on granite buildings in your issue of the 22nd ult. As economy is the order of the day, allow me to suggest, that if granite should be considered suitable for the general wall-face of the Law Courts or any other public building, the powers that be might buy up a large portion of the old granite road-sets, I should think cheap, and so haste the advent of easy locomotion, quiet thoroughfares, freedom from dust, and provide an immeasurable boon for the natives. The sets would make capital wall stones with but little dressing, and would cost perhaps half what Mr. Travis quotes. Buildings entirely of granite look well in granite countries: one appreciates the suitability of the thing as a local material, but I fear they would look melancholy in London. Certainly anything looks better than Portland stone for a general wall-face. Can anything look more ghastly? Can any stone weather with more disfiguring stains than Portland? I do not think, however, that we see enough of our Yorkshire sandstones in London, or that they are sufficiently appreciated. They can now be obtained in unlimited quantities, of every texture, from the coarsest grit, suitable for heavy work, to stuff that will hold an arris as firm as any limestone, marbles excepted. To mention one of the nearest quarries as a guide: the stone raised at Darfield, near Barnsley (Mr. Stephen Seal's quarries), is delivered at S. Pancras at 1s. 9d. per foot cube fresh from the quarry; it works easily, and will carry a splendid arris, and it will stand fire and weather very satisfactorily. The Oaks quarries are near these, and supply a good stone of rather warmer colour. Very fine blue stones are got from near Chesterfield, Sheffield, and Handsworth; they are very close in texture, but rather expensive to work. Going a little further north we come upon the Leeds, Bradford, and Halifax districts, and it is impossible to speak too highly of the qualities of such stones as the Bramley Fall and Guiseley for strong rough work, or the Hare Hills, Park Spring, and Potters Newton (all from Leeds) for fine work. The Ringby and Owram stones from Halifax are also splendid stones, and will hold an arris or carve as fine as limestone, and stand weather infinitely better. As far as resisting smoke and acids are concerned, we have no smoke here to equal Sheffield, Leeds, Bradford, or Halifax, and the beauties of these stones would be much more conspicuous here than in their native country. Speaking from actual experience in the use of the stones I have referred to (I have only mentioned those I have used), I can confidently recommend your readers to consider the claims of our Yorkshire sandstones in selecting for their London works. I may add that if any architect is particularly interested in the subject, I shall be happy to show him samples of these and other stones, and give him any information that my small collection of building materials can afford him.—I am, &c.,

Thos. Chas. Sorby.

27, Brunswick-square.

ORGANS IN CHURCHES.

Sir,—Your correspondent, "W. W.," while professing great humility in asking for information, cannot help indulging in sneering remarks on the "perfection and infallibility" which he attributes to the members of the architectural profession, a qualification that I am not aware they arrogate to themselves. It is fair to presume that architects who have practised ecclesiastical design for some years, and thrown their whole energies in the pursuit, are more capable of forming an opinion, architecturally and artistically, of the suitability of any fittings than an incumbent, a churchwarden, or an organ builder. The latter personage is merely solicitous of placing his instrument in a conspicuous situation (as a trade advertisement), however much it may mar the appearance of the edifice, and it seems that his art is so far superior to that of the "infallible" architect, that he must thrust in a hideously-designed organ case (for hideous they invariably are, with the exception of those produced by one or two of the leading London builders), or "his feelings are hurt," which is a thing to be avoided at any sacrifice. Your correspondent thinks that it is only for ritualistic purposes that the organ is placed at the east end. Well, supposing it is so. If his remarks refer to the Established Church, it is in every sense of the word a ritualistic one, and the ritual ought to be adhered to, instead of which some ministers, through carelessness, have so far degenerated as to neglect everything like "decency and order," as enjoined in the rubric.

But to keep strictly to the subject: so long as any buildings are to be designed to suit the present services, the east end is the proper place for the organ and choir; the congregation are seated to face in that direction, the pulpit is generally there, and it is only natural that the congregation should have in front of them the music, which takes the lead in that part of the service. Giving the organ builders whose feelings are so wounded every credit for their mechanical skill, it does not always follow that if they can create harmony they are always most perfect in acoustics. As to the loss of 30 or 40 per cent. of value, I am not quite sure what that means, but I have known many instances where the loss of 50 per cent. of sound would be a great boon to the congregation, particularly where they are blessed with an ambitious organist who is partial to thunder. I have no doubt that in most instances the organ chambers provided are sufficient for the purpose if the parts of the instrument are properly disposed. I sincerely hope that this question, as well as the ventilation of churches generally, will be taken up by competent authorities, and that those parochial magnates who are too ignorant to respect the labours of the architect may not be allowed to "wound the feelings" of those who can appreciate anything artistic, by making absurd alterations, or blocking up windows with an ugly box of whistles. "W. W." says that "the organs in France are placed at the west end." I dare say they are, and in many instances they are so placed here, because there happens to be no provision made for them elsewhere, the instrument being comparatively a modern innovation.—I am, &c.,

X. X.

GREEK AND GOTHIC.

Sir,—The hallucination under which Mr. Gildard labours is this. "That the Greek architecture of the Parthenon is the greatest achievement of human genius." I cannot say that his devotion is worthy of a better cause, for I think it brings no dishonour on his taste. If he would only condescend to ask something less than a monopoly of all the beauty and constructive genius in architecture for his *beau ideal* I should say he is not far astray. But the position he has taken up is only a fossil curiosity in the world of opinion on the subject. The Gothic of Mr. Gildard is the Gothic of other days. Must I remind him that the battle has shifted since the five orders of architecture were gravely supposed to be the sum of a saving knowledge of the art? Gothic has recovered its ground in virtue of its poetic genius, its structural economy and skill, and its æsthetic affinities with the powers of spiritual life. What was once rude and barbarous to eyes dazzled with the mere intellectual beauty of the Greek, is now allowed to be a masterpiece of architectural dynamics, and the only true exponent there has ever been, in architecture, of the moral and spiritual advancement of the world. But this spiritual beauty, this marvellous constructive might, is a *terra incognita* to Mr. Gildard. From the Acropolis of his little world of Greek he looks out, but cannot see the majestic forms in the far horizon of an older or a wiser world. His almost only specimen of Greek, though perched a-top of all the "extravagant panegyric" of his commonplace book, is puny in its sublimity beside the pyramids and temples of the Nile, in magnitude and scientific power in presence of the monuments of Roman genius; and with all its sculpture, meagre in the compass of its beauty and insignficant in its method of construction, compared with the architecture of the arch as developed by the Moslem and the Goth. Confessedly unfamiliar as Mr. Gildard is with works which contain the latest and deepest researches into the form and spirit of the Gothic, I cease to wonder that this method of discussion only betrays the inverted bias of his logic, and the irrelevancy of a captious critic.

In evidence whereof, and as my apology for declining further correspondence, marching up and only marching down again, with Mr. Gildard, I shall give a few specimens of his controversial method, or otherwise his extreme inaccuracy.

In the following extraordinary passage he disposes, apparently to his own satisfaction, of my defence of the term "Greco-Egyptian."—"The authority in whom he has such 'Boswellian faith' says that: 'Greek and Egyptian ornament is mere superficial work, languid and lifeless,' and 'Greek' and 'Egyptian' being joined by a copulative conjunction, and this followed by a verb in the singular number (grammatically enough), 'the above is explanatory of my speaking of the Greco-Egyptian style in the works of Mr. Thomson.' But Greco-Egyptian, whatever that may be, is not in question, and as the greater contains the less, a style is something more than the mere character of its ornament." This passage contains so many unpardonable blunders that I may well be sceptical of Mr. Gildard's sincerity or his capacity to understand and consequently answer any argument. 1. The grammar and logical coherence of the first sentence is inexplicable, and I offer £5 to any one who parses it. 2. His criticism of Mr. Ruskin's grammar is no less at fault. 3. He says that "Greco-Egyptian is not the question," when it is the subject-matter of the question which he asked himself, and to which, but for his asking it, I had not thought it necessary to reply. 4. He suppresses, or has never read, what I said as to other points of resemblance besides "ornament" in the Greco-Egyptian characters of some modern Greek. 5 (as a corollary from No. 4). His carelessness or confusion of thought in not taking pains to understand what he undertook to answer.

As to the subject itself, I am content to refer it to, and abide by, the decision of Mr. Thomson himself. I shall add, that if Mr. Gildard had only read what I had written he might have saved himself the trouble of proving Mr. Thomson's power over "that least plastic of all styles" the Greek, as I have spoken on this point at least as strongly as himself.

As another specimen of his inaccuracy take the following:—In his former letter Mr. Gildard said, "Legitimate architecture is art, not imitative like painting and sculpture, but creative." But in his last letter he tells us that sculpture is no longer "imitative" but "creative." He is replying to a *reductio ad absurdum*, in which I said that the Parthenon was not legitimate architecture, as its chief glory was its sculpture, and that according to Mr. Gildard was "imitative" not "creative" art. The logical necessities of his false position leads him in his letter to confute himself. I have then for once succeeded, and by exhibition of his nonsense led him back to sense. The truth is, that sculpture and painting are both "imitative" and "creative:" imitative up to a certain point, when the creative power of the artist is required to work, and which makes his work the work of genius. As to the limits within which imitation of nature is allowable, I think it must be quite impossible for Mr. Gildard, with his confusion of thought upon the subject, to decide; and (as a corollary from this) not much dependence can be placed upon his argument in the passage alluded to. As to this vexed question of Pre-Raphaelitism (on which he touches), I have no Boswellian faith in any one. I think Professor Poynter puts it very clearly, and not less gracefully, when he adds, that perhaps Mr. Ruskin's teaching has been misapprehended as well as misapplied. There is an obvious truth underlying all that teaching—viz., the love of nature as it comes from the hand of God. The idealistic too, may be overdone. We could never be content with only the honeysuckle of the Greek. As typical of manysided life, the vegetable ornament of the Greek is utterly worthless. Under its chilling touch the lilies of the field lose all their power to teach, and I would a thousand times rather an extinguisher were placed on the *odi profanum vulgus* feeling, than part with a beauty which all hearts were made to feel.

I shall notice only another specimen of his method. It will be found in his remarks on the passage in which I spoke of the poverty of the Greek in capacity for beautiful development. He objects to the expression "rigid Doric of the Parthenon," and yet allows that the Greek is the "least plastic" of all styles. He goes on to show that Greek can be "applied" to, if not developed into, anything and everything—warehouses, shops, churches, &c. I never doubted the application of Greek, or the extent of its misapplication either. We have had far too much of it; and if the application of Gothic in many cases has been unhappy, the same can be said with equal justice of the Greek. That it can be made appropriate and picturesque under the hand of Mr. Thomson I believe, and would readily go even further. But still the rigid Doric of the Parthenon is inimitable in its beauty; any application of the architecture of the lintel will always be other than the Parthenon, and far far beneath it; and then, it will no longer be "the best," or better than the Gothic; and, consequently, what becomes of Mr. Gildard's argument for the application of Greek as superior to Gothic for our churches?

I shall make another and a last attempt to open Mr. Gildard's apprehension as to the fact that there is no inconsistency whatever in my speaking of the Parthenon as perfect and yet claiming a higher kind of perfection for the Gothic, and one which makes it much more suitable as the style for our church architecture. Mr. Gildard says: "I have more than once asked for mention of the Gothic building which is of equal or surpassing beauty to the Parthenon." I did mention the Church of S. Ouen at Rouen; but, of course, in his eccentric style of reading he has missed the sentence. There are 100 others. He may take a trip to Paris and compare the Madeleine with Notre Dame, or he may put Mr. Street in his pocket and go to Spain, or he may make the tour of Normandy, or he may get a Cook's excursion ticket, and with Viollet le Duc and the "Stones of Venice" in his carpet-bag he might study S. Mark's and the Cathedrals of Milan and Rheims, Antwerp and Rouen, &c., in any and all of which he will find sculpture with more of higher meaning in it than the Parthenonic frieze, pillars of more varied beauty, and as gracefully proportional for their office as any pillar in the Parthenon. He will find interiors compared with which the cella of the Parthenon is but a packing-box, and much marvellous construction in groined roofs and traceried windows, &c., all as perfect of their kind as the nice constructions of the Greek. Speaking of interiors, he need not go beyond the crypt of Glasgow Cathedral, there he will find more of constructive genius and a greater achievement in that way than ever was or can ever be in Greek. Indeed, as to giving examples, I might draw up a catalogue as long as that of the Homeric ships, and crave your indulgence for a supplement, were it not that with my sad but sure experience of Mr. Gildard's mode of argument I feel assured that indulgence would be thrown away. One example after another would be rejected—an "indigesta moles"—by his dainty appetite. In these circumstances, I can only indicate the grounds on which, I think, judgment in this matter must proceed, and help him to see more clearly.

I am not forgetting that he calls loudly out for "a greater work than the frieze of the Parthenon." Now, I consider this as strong indication of his unhealthy appetite. The frieze of the Parthenon is always cropping up. It seems to be the only thing he has much liking for in the Greek. From its perfection he draws wild conclusions as to the infinite genius of the architecture it adorns, and for the character of which, if it is responsible, it had not the merit of devising. Phidias did not design the Parthenon. It would be interesting to know what would have been thought of Greek architecture without its Phidias.

Now, this sculpture is really essential to Greek architecture, or it is not. If it be, then Mr. Gildard's argument for Greek churches falls to the ground, as we cannot command the labours of a Phidias but on rare occasions, and besides, the Puritan in Mr. Gildard would rebel against interior decoration of this kind. If it be not essential, then he has no right to ask me to point out any Gothic sample of sculpture of equal or surpassing beauty. I might decline to furnish it, but I will rather try to gratify his wish. Though I am no judge of sculpture in its high development, I have good authority for saying this—his favourite frieze, with all its many perfections, is far from perfect as a sample of the highest art. "Human beauty," says Sir C. Eastlake, "is not complete, unless it bear the impress of mind, controlling and spiritualising it. It is here that Greek art is found wanting. It is eminently expressive of mind, but not of mind in its highest and holiest relations. It was all sufficient to define the outward human being, but the definition of the moral attributes required a criterion which Nature could not supply. Soul is wanting, the true attributes of the moral being are never approached." I may not be wrong, then, in saying, that the feats of the intellectual athletes of Athens have never been excelled, and that the sculpture of the Gothic has a perfection of its own which is higher art than that of Phidias. Gothic statuary, though not possessed of the graceful form and attitudes of archetypal man, may, I think, and ought to be allowed to possess a surpassing beauty. Of course, if Phidias had lived a Christian sculptor, we might have had something finer still; but on this point I do not speculate. As to the perfection of the sculptured foliage of Gothic, enriching the lines and spaces of construction, it is, of course, without a rival. The scale of vegetable form in Greek is very meagre, however perfect in its place. (Here I may be allowed to say that where it occurs upon a frieze and executed here, it has a very *freezing* effect on the spectator. There is not only a very rigid, but a frigid look about it to which I much prefer the bracing air and "frosty fortitude" of Gothic foliage.) I put the above in a parenthesis as not essential to the argument. Mr. Gildard compares Greek ornament to "the sweet south, that breathes upon a bank of violets." The force of his imagination goes far, but I wish we had the violets. In reference to architecture, apart from its accessory sculpture, its power and expressiveness—here, too, I have no doubt but that Gothic bears the palm of a surpassing beauty. And why? Because the greater comprehends the less, and it expresses more than Greek.

Greek is the expression of the *vis inertia* of matter, Gothic of dynamic law. Greek is expressive of static, Gothic of dynamic equilibrium. The Greek is suggestive only of the passive, Gothic of the active conditions of existence. The Greek is the symbol of stability and repose, the Gothic of motive power and the active energy of life. The one is more allied to the material, the other to the spiritual in expression. This has been well put by McVicar, in his "Philosophy of the Beautiful." "A Greek temple has an admirable expression of stability, it so fully displays those perpendicular and horizontal lines which the law of gravitation tends everywhere in nature to produce, that it looks as if no tempest, no lapse of ages could ever throw it down. And hence, also, about a Greek temple there is the charm of a religious expression, for in virtue of its obvious stability it seems to refer itself to eternity. At the same time, much more may be justly said in favour of the Gothic Cathedral as a place of worship, for while, on the one hand, in virtue of the rhombic angles, the lance and lozenge forms which everywhere meet the eye, it is more purely beautiful than the Greek temple. . . . On the other hand, it has to a wonderful extent risen above its earthly load. In aiming at and achieving a victory over the weight of the materials of which it had to be constructed, and in telling its towers to find their home in the sky, the cathedral has prepared the way for the worshipper within its walls." So much for the superiority of Gothic expression for our larger places of worship. Let another admirer of Classic and the classics speak a word for Gothic in the village church:—

"For the village, the old picturesque church is the proper thing, with its tower and its trees, as at Hendon and Finchley, or its spire, as at Beckingham. Classical beauty is one thing, Gothic or Saxon beauty is another —quite as genuine in its way, and in this instance more suitable. It has been well observed, that what is called Classical architecture, though of older date than the Gothic, really does not look so old—does not so well convey the sentiment of antiquity; that is to say, the ideal associations of this world, however ancient, are far surpassed in the reach of ages by those of religion and the patriarchs of another world, and that Greek and Roman architecture, in its smoothness and polish, has an unfading look of youth. It might be thought that the erection of new churches on the Classical principle (taking it for granted that they remind us more of Greek and Roman temples than of their own absurdity) would be favourable to the growth of liberality. We do not think so. . . We could fancy the most liberal doctrines preached 500 years hence in churches precisely like those of our ancestors; but these new, fine, heartless-looking, showy churches, neither one thing nor the other, have, to our eyes, an appearance of nothing but worldliness and a job." And Leigh Hunt is speaking of a popular development of Greek, or the architecture of the arch fettered by its adherence to the Greek.

It only remains to repeat that in point of constructive genius the Gothic undoubtedly excels the Greek. This Mr. Gildard conveniently ignores, or would discredit as "having strewed Europe with ruins." I am prepared to show that this is really only a piece of poetical exaggeration. These ruins are the ruins mostly of Classic buildings, and his destructive wedge is not quite so dangerous in the Pointed architecture. But I let that pass, as I am defending the architecture of the arch from a vile aspersion. It will be found that the ruins in question are mostly the ruins of structures which were abandoned as no longer needed—which had been ravaged by the ruthless hands of war, or used as quarries for other buildings. He will find many a noble castled keep in ruins with no arch destroyer in its walls. The fact is, as soon as a building is suffered to go into decay there are many influences at work other than its own dynamics to bring it down, and which I need not specify. Need I remind Mr. Gildard that if the arch be a destructive radical it is also a good conservative, supplying the defects inherent in the architecture of the lintel? It is quite possible, by abutment properly designed, to construct the arch and the vault so as to make them as durable as their material. So long as care is taken to preserve them, our cathedrals are likely to stand long enough.

The architectural dynamics of the Gothic are its glory, and the expression of stability in a cathedral is far more noble in its kind than the stability of the Greek. Its structure is the counterpart of the mechanism and dynamics of the heavens, of the wisdom which so adjusts the equilibrium of planetary motions that whilst careering with inconceivable velocity in space the down of the thistle is not disturbed. It is true the stability of our system may not last for ever, and Gothic buildings may fall piecemeal to ruin faster than the Parthenon. But once ruinous and useless, the sooner they go down the better in many instances. If it be only kept in good repair and water-tight, Glasgow Cathedral may outlast the Parthenon, always supposing that it be transplanted to the Molindinar, where the rain and fogs, and frosts and ice, and chemical influences of S. Rollox smoke, will supply wedges enough, and drive them home just as effectually as the sleepless thrust of the architecture of the arch.—I am, &c., ANOTHER PROTESTANT AND ARCHITECT.

[We shall be unable to find space for a continuation of this discussion. We have mislaid "Another Protestant and Architect's" address. Will he kindly send it again?—ED.]

THE "BUILDING NEWS" COMPETITIONS.

SIR,—It has been no small satisfaction to me that the competitions which, with others, I have advocated, have proved so successful, more especially as they have been left almost entirely in the hands of correspondents and competitors. I am not aware of a more direct and effectual channel for helping forward young men of talent, or encouraging nobler sentiment and chivalry in their ranks, or of ensuring clearer light upon those phases of architectural practice upon which they treat, than these BUILDING NEWS competitions. In their very nature they encourage deep and careful study, exercise of thought, facility of invention, large and liberal ideas, good taste, successful planning, clever draughtsmanship, and, in fact, the chief elements which go to make up a successful architect. The number of competitors shows how widely they are appreciated. Men—doubtless, mostly young men—from all parts of the kingdom, place themselves on one common platform, and surely it is no small honour to stand out in relief amongst so large a number selected from so vast a field. Moreover, they have already demonstrated, that notwithstanding the many superior opportunities for education which the metropolis affords, the best architectural talent in the kingdom is not necessarily centred in London.

And now for another competition. About a month since interesting articles and letters appeared in the BUILDING NEWS on the "Dawn of Thought in Church Design." Those articles were the outcome of the Leeds Church Congress, where with singular unanimity amongst architects, clericals, and laymen, the condemnation of the present state of church architecture was loud and deep. Scarcely an individual could be found to defend a single feature of the pattern churches, which, designed, as they originally were, for Roman ritual, are evidently unsuited for the Protestant forms of worship. This, moreover, is fully expressive of the ideas of the lay members of the church who take an intelligent view of ecclesiastical architecture; and there are those who, with Professor Kerr, can see faint indications of a turn in the tide.

I know that there are those who may possibly hold up their hands in amazement at these views, but then we must remember that there is hardly a profession so utterly conservative, singular, and exclusive as the present race of church architects. There are men who are wrapt up with that clerical element whose chief support lies in a resuscitated architectural symbolism and other extraneous aids. The revival of Mediæval architecture with Mediæval ritual is a remarkable coincidence. Fraternisation characterises the ritual architect and the ritual clergyman. But there are other strongly defined and powerful sections of the church, and especially the Nonconformists, who have but little sympathy for their ideas. I say this much by way of introduction, because I am fully aware that those who look forward to a modification of ecclesiastical architecture may expect no aid or sympathy from the present race of church architects, who are only too thoroughly the slaves of precedent and custom.

In compliance with your invitation I beg, therefore, to suggest that the next BUILDING NEWS competition be for a town church. As there is little or no material difference in the ritual of the Established and Noncomformist Churches, the competition may be for either or both. The following conditions should be complied with:—

1. Sittings for 1,200, cost £10,000.
2. At least 96 per cent. to have a clear uninterrupted view of the pulpit.
3. The most perfect proportions for acoustic effect.
4. An unmistakeable ecclesiastical "feeling" to pervade the architecture.

Honour to the man who can successfully solve these four problems!—I am, &c., H.

SIR,—In the event of a paucity of suggestions anent the above-mentioned, or a lack of better ones than the following, pray award them space and consideration:—1. A small church or chapel. 2. A free library and reading-room. 3. A literary and scientific or mechanics' institute. 4. A tavern or small hotel. 5. A public hall and offices. 6. Cemetery, chapels, lodges, and entrance gates. 7. A memorial tower. 8. A suite of town offices. 9. A police and fire station. 10. A theatre. 11. A railway station. 12. An aquarium. 13. A shop front. 14. A club house. 15. A bank. 16. A workhouse. 17. A lunatic asylum. 18. A prison. 19. A row of almshouses. 20. Stabling. 21. A farmstead. 22. A terrace. 23. A pair of residences. With a preference for priority of citation. —I am, &c., F.

SIR,—I have read your article on "School Planning Competition," and in accordance with your closing paragraph, inviting suggestions for a new competition, I would say let us have a little change from architectural subjects. I would suggest a prize for the best drawing of a chimney-shaft for carrying off the smoke, &c., from a factory. I should also suggest a prize for best essay on constructional ironwork and a prize for best iron roof of (say) 50ft. or 100ft. span.—I am, &c.,

J. ROBINSON.

20, Highbury-crescent, Islington, N., Dec. 10.

SIR,—In your impression of the 6th inst., after announcing the result of the BUILDING NEWS School Planning Competition, you invite suggestions for subjects for future competitions. You might, I think, give engineers a turn, and so I beg to suggest a bridge across a wide river, necessitating a number of arches, with a certain headway and waterway, and sustaining a stipulated load per square foot; and that it may be a *bonâ fide* engineering scheme there might be one or more opening spans. A railway over the bridge might be stipulated. I also beg to suggest that no coloured drawings be allowed, as in your last competition.—I am, &c., J. O.

[Before receiving the above we intended to set on foot a civil engineering competition.—ED.]

TO ARCHITECTS AND CONTRACTORS.

SIR,—The value of your publication is undoubtedly guaranteed by its very large and wide circulation, and its recognised usefulness to the professional man and the builder. Its value might yet, I think, be considerably enhanced if you could persuade the London and provincial architects, who from time to time supply you with lists of tenders for proposed works, to make a rule of also giving the cubical contents of the buildings contracted for, as did Messrs. Elliott & Warren, last week, for the new schools to be erected in Woodpecker-road, New Cross, for the London School Board. The value of such information, I am sure, will be obvious to all professional men who are called upon to prepare drawings and estimates for works beyond their own immediate locality, and I trust the suggestion may not be deemed unreasonable, but may meet with a favourable response.—I am, &c.,

THOMAS CARTER.

Trinity Cottage, Southfields, Leicester, Dec. 10.

MEDIÆVAL ARCHITECTURE.

SIR,—In your report last week of my essay, read before the Architectural Association on the 29th ult., the general theory is injured by a slight incorrectness in the following sentence:—"In the churches of Kent and Surrey, led, probably by the beautiful little church at Stone, bar tracery was first used, the consideration of which brought the author to the Decorated period, first, however, noticing a separate school existing at Wells, which shortly afterwards became engrafted on that of Godfrey de Lucy." Now, there should be a full stop after the words "Decorated period," that being the end of the Early English "school" started by William of Sens, and at least a few words should have been given to the work of Godfrey de Lucy, the founder of the second "school," before proceeding to speak of Wells Cathedral. "The north porch of this cathedral," moreover, "shows many (Norman) peculiarities," the word "Norman" being omitted in your report. Will you kindly insert this in your next impression.—I am, &c., F. P. JOHNSON.

12, Lucas-terrace, Alfred-street, Bow, Dec. 10.

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RECENT PATENTS CONNECTED WITH THE BUILDING TRADES.

1436. T. MAYNARD, Dawley, Middlesex, "Manufacture of bricks."—Dated 11th May, 1872.

This invention consists in reburning bricks which have been imperfectly burnt and known as place bricks and other red bricks in a kiln constructed of two parallel walls supported by buttresses, and having openings at the lower parts for the ignition of the fuel. The fuel employed is small coal, coke, and common breeze, either combined or separately. This fuel is also applicable to reburning in the ordinary clamp.

1474. P. JENSEN, London, "Construction of bridge piers, wharves, &c." A communication.—Dated 15th May, 1872.

This invention consists in constructing a working platform for building bridges. The piers are cast in concrete round a hollow cylinder with outside screw threads. Somewhat similar means adapted for building wharves and docks. Means provided for raising the ground water, and for working under a low air pressure. A mode is described for obtaining a model or counterpart of the bottom of the sea.

1518. W. C. HENDERSON, Walthamstow, Essex, "Securing panes of window-glass."—Dated 18th May, 1872.

A groove is prepared on each side of the middle of each sash bar under the edge of the glass for roof lights, and the panes are simply laid to overlap each other, or end to end, as the case may be, and are held in position by short cross pieces of metal or other material, covered or faced at or near their ends by suitable elastic material (indiarubber vulcanised or prepared). Each of the cross pieces is secured to the frame by a screw through the middle part of it, one end pressing on the glass at one side, and the other end on the glass at the other side of that bar, except those for the side sheets, which are single ended. The pieces of indiarubber are each formed with a shoulder or projection for use where one sheet or pane overlaps the other, that one part may press on the lower sheet and the other on the upper, or when the sheets or panes are placed end to end, these elastic pieces rest on the adjoining ends of both sheets or panes.

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S. Green, of Manchester, writes:—"Since your excellent article in the BUILDING NEWS on the frequent accidents which occur in Manchester, three accidents have happened, viz., to a labourer employed at the new Insurance Buildings, Abbey-square; to a stonemason at the new Town Hall; and to a joiner at a new warehouse in Bond-street."

Intercommunication.

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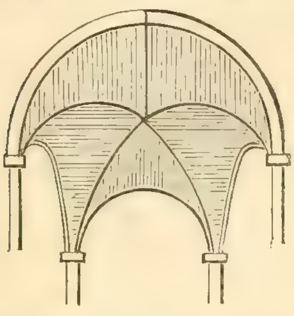
QUESTIONS.

[2724.]—**Sketching Mouldings.**—Will any one kindly inform me as to sketching mouldings? I have hitherto used a piece of copper wire, softened, but this does not answer well.—S. S. H.

[2725.]—**Groins.**—Could any of your practical readers inform me how the bricks should be cut at the groin points of Gothic arches? Can the bricks be cut to bond at the groin point? Is the groin point a straight mortar joint? I perceive in stone groins the angles are worked out of a solid bonder, as per sketch. Can brickwork be done the same? A sketch showing the manner how the brick is cut would oblige.—PORTSMOUTH.



[2726.]—**The Architectural Dictionary.**—Can any of your numerous readers give me any information relative to the Architectural Dictionary, whether there is any prospect of another part and index being published?—H. C. I.

[2727.]—**Xylotecnigraphy.**—About a year or so ago a notice of the above process, as practised by Messrs. Trollope, appeared in the BUILDING NEWS. Can any of your readers supply me with the details of the process as applied to the natural wood? "An Experienced Workman" shortly afterwards noticed the process, saying it was not at all new, and promised to explain it, but I have not been able to find his explanation. Would he do so now, or explain the process known to himself?—J. S.

REPLIES.

[2697.]—**Colours to Represent Materials.**—Your correspondent "M. B. A." gives you a list of tints which he says have been used for some time in his office. I am glad to hear it, as, having myself originally arranged them above a year ago I, of course, recommend them. The chief value of the selection is this, that the tints serve well for both section and surface. Used deeply for sections, and faintly, if at all, for surfaces (or "elevational" parts), they pretty well resemble the natural colours of the materials. "M. B. A." gives the mode of mixing the tints with some half-dozen ordinary office colours—gamboge, burnt sienna, sepia, indigo, Prussian blue, and lake. He ought also to have named the tints for such as prefer buying them ready-made of a colourman. They are as follows:—

BRICK.—Venetian red.
BRONZE.—Sap green.
BRASS.—Gamboge.
CONCRETE.—Any gray mottle.
CLAY.—Burnt umber.
CEMENTS.—Sepia
COPPER.—Deep orange chrome.
EARTH.—Purple brown.
FIR AND PINE (rough).—Raw sienna.
FIR AND PINE (wrought).—Burnt sienna.
GLASS.—Prussian green.
IRON (cast).—Payne's gray.
IRON (wrought).—Prussian blue.
LEAD.—Blue black.
MAHOGANY.—Purple madder.
OAK.—Brown pink.
OLD BUILDINGS.—Neutral tint.
PLASTER.—Violet.
STONE (rough).—Light India ink.
STONE (wrought).—Lighter India ink, or speckle.
SLATE.—Sage green.
TILES.—Light red.
WATER.—Emerald green.
—W. Y.

[2697.]—**Colours to Represent Materials.**—In reply to the query of "One Intended for the Profession," I send a list of colours. "T. C. H." is wrong in recommending that the tints should be mixed together; it is much better for them to be ready-made colours if possible. "M. B. A." has not fallen into this error so much, but several of his colours are only fit for auctioneers, builders, or estate agents:—

BRICK.—Venetian red.
BRASS.—Gamboge.
CEMENTS.—Indian ink.
CONCRETE.—Sepia.
FIR, PINE, OR DEAL.—Burnt umber.
GLASS.—Indigo with sepia externally, Prussian blue internally.
IRON (cast).—Prussian blue.
IRON (wrought).—Indigo.
LEAD.—Indigo with Indian ink.
MAHOGANY.—Purple madder.
OAK.—Brown pink.
PLASTER.—Neutral tint.
SLATE.—Prussian blue with Indian ink.
STONE.—Yellow ochre.
TILES.—Indian red with a little burnt umber.
—H. W. P.

[2700.]—**Surveying.**—In his reply to my question "Karl" did not state whether the results obtained by the formula given by him were strictly or approximately accurate. To take an instance of a triangle whose sides are 236, 250, and 236 links enclosing a quarter of an acre, the result obtained by "Karl's" formula would be 0a. 1r. 4½p., which would not be correct enough for practical purposes. Also, by the same formula, the length of the perpendicular of an equilateral triangle is equal to the length of one of its sides, which is impossible.—C. W. F.

[2700.]—**Surveying.**—The great worth of your Intercommunication column being the generally invariable accuracy of the information given, I have hoped to see a correction of the reply to the above by "Karl" in your impression of the 29th ult. In the first place, information was specially asked as to obtaining the area without plotting, so that the first half of the reply was superfluous; and in the second place, the second half is entirely erroneous, for except in a right-angled triangle the proportion AB : AC : : BD : BC (BD being the perpendicular from the vertex on the base) does *not* hold. Practically, the sides alone being given, the formula quoted by "C. W. F." would be employed to find the area; although it would be possible, by the use of various trigonometrical ratios, to find any one of the angles (A, for instance), and then make use of the equation $\text{area} = \frac{1}{2}\, b\, c \sin. A$.—T. H. E.

[2705.]—**Barytes in Paint.**—Barytes in paint is an adulteration used in white lead, and lessens the body of the colour. Its presence may be tested by taking some of the adulterated white lead and adding thereto nitric acid in solution; if there is no barytes, all of the paint will be dissolved; but if there is, a sediment of barytes is left, which will not dissolve in nitric acid, whereas white lead will.—CHEMICUS.

[2713.]—**To Prevent Echo.**—Although I have not much faith in the nostrums which teem in the newspapers of the United States, there was one, if I mistake not, recently quoted in the BUILDING NEWS which might be worth trying on the church at Harlow. The remedy proposed consisted in stretching wires across the building so as to break the waves of sound. There were no particulars given beyond stating that the wires must be placed so as to catch or intercept the voice, and this might be ascertained in a few trials. —AN AMATEUR.

[2717.]—**Best Material for Taking Rubbings.**—Impressions of the ancient incised stones, to which I presume your correspondent "An Old Subscriber" refers, are taken by means of thin unsized cartridge-paper, damped and pressed on to the stone by means of a silk handkerchief. Impressions are thus obtained which, if allowed to dry undisturbed, are not easily effaced. Rubbings of monumental brasses are best taken by means of the "heel ball" used by shoemakers. —ANTIQUARIAN.

[2719.]—**Cleaning Walls.**—Take a piece of flat smooth freestone and rub wlth water. An old wipe may do the dusting.—RUSTICUS, Cumberland.

[2722.]—**Brickmaking.**—Sea-sand will do very well if it be blown to mix the clay with, but the common soft sand laying near low water is useless. I should prefer house ashes, which will adulterate the clay and spare the fuel, and will also be likely to secure a better brick—a great desideratum.—RUSTICUS, Cumberland.

[2722.]—**Brickmaking.**—Sea-sand is objectionable on account of the salt it contains. If used, it must be thoroughly washed, but even then the bricks would probably effloresce.—J. S.

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CHIPS.

The foundation stone of a new Baptist Chapel was laid at Maidenhead on Tuesday week. The dimensions are 51ft. by 31ft., the accommodation will be for 280 persons on the floor, and the gallery another 200. There is also to be a lecture room, large enough for eighty people, together with a vestry. The architect is Mr. Vardy, and the builder Mr. Woodbridge.

A new church, dedicated to S. Augustine, is to be commenced in Halifax in the spring, from the designs of Mr. Waterhouse.

Arrangements have been completed for erecting a window to the memory of the late Sir John Herschel, in the parish church of Hawkhurst, Kent. The subject of the window is to be the "Wise Men of the East Following the Guiding Star to the Place of the Nativity." The cost will be about £160.

On Monday the foundation stone of the new church of S. Paul, Harrow-road, Paddington, was laid. The church is erecting, from designs by Mr. E. H. Blackburne, in the Gothic style, and will accommodate 800 worshippers.

A new Evangelical Union Church was opened in Galashiels on Sunday last. The church was designed by Mr. Frank Lynes, a local architect.

A company has been formed at Clitheroe, with a capital of £3,000, for the purpose of erecting a public hall. The design has been entrusted to Mr. William S. Varley, architect, Blackburn.

Our Office Table.

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SOCIETY OF ANTIQUARIES OF LONDON.—On Thursday week the Rev. W. C. Lukis, M.A., F.S.A., rector of Wath, near Ripon, read a paper respecting the construction of French Chambered Barrows. This was intended to be the first of two or three papers on Rude Stone Monuments. The chief object on Thursday was to correct three prevailing errors:—1. That some of the tombs were always, as now, "free standing"—*i.e.*, formed of upright stones, supporting flat roofs, as we now see them, standing on the natural surface, wholly exposed, never having had any artificial envelopments of earth. 2. That some of the tombs had their roofing-slabs always, as now, supported at one end on one or more uprights, and the other end resting on the ground. These have been denominated by French antiquaries "Demi-dolmens," and by English "Earth-fast dolmens." 3. That some stone chambers were erected on the top of their artificial mounds, and were always partly or wholly exposed to view. The paper was copiously illustrated with large diagrams drawn to scale. It was in part intended to be a review of a recent work on the "Rude Stone Monuments in all Countries," by Mr. Fergusson, from whose conclusions with reference to French monuments Mr. Lukis entirely dissented.

THE AMERICAN SOCIETY OF CIVIL ENGINEERS.—The eighth annual meeting of this society was held on the twentieth anniversary of its foundation, November 6 last, at the society's rooms, 63, William-street, New York. Papers as follows were presented:—"Record of some Experiments showing the Character and Position of Neutral Axes as seen by Polarised Light," by Louis Nickerson, C.E., of S. Louis, Mo. "Coal Cutting Machinery in England," by T. Guilford Smith, C.E., of Lansingburgh, N.Y.; and "Alcohol as an Illuminator in the Condensed Atmosphere of New York Caisson, East River Bridge," by Francis Collingwood, C.E. The annual report of the Board of Direction upon the affairs of the society, with brief memoirs of two of the members who died during the year, was read. The next and fifth annual convention of the society will be held at Louisville, Ky., May 14 and 15 next.

INTERESTING DISCOVERIES IN THE ALEUTIAN ISLANDS.—Dr. W. H. Dall, of the U.S. Coast Survey, has been making explorations of late among the Aleutian Islands, and has discovered various remains of prehistoric natives, such as lamps, knives, spoons, arrow-heads, hearthstones, and skeletons. Around the sites of ancient villages he found several specimens of peculiar ways of burial. In certain places a sort of cave was formed under overhanging rocks, and here were put the bodies of the dead, preserved and gaily dressed. Some of them were covered entirely with wooden armour. Occasionally, the cave had a theatrical appearance; the bodies of renowned hunters were placed in canoes, armed, and apparently rowing. Women were represented engaged in the labours of their lives—sewing, dressing skins, or holding their children; and old men were seated about the walls, seeming to beat the drums to whose rough music their fellows once danced in winter. A few years ago Captain E. G. Fast, of the U.S. Army, made a very extensive search in Alaska for similar records of a now forgotten people, and brought to New York a magnificent collection of specimens of curious armour, clothing, ornaments, domestic utensils, weapons, &c.

CLEANLINESS AT THE EAST END.—At the last meeting of the Whitechapel District Board of Works, it was resolved unanimously that to require compliance with the regulations authorised by the Board of Trade with regard to the fittings for a constant supply of water will entail costs so excessive as to become oppressive. At the last meeting of the Mile-end Old Town Vestry it was also unanimously resolved, "That, notwithstanding the advantages which may be expected to arise from a constant supply of water in this district, the regulations adopted by the Board of Trade are so unsatisfactory, and would lead to such an enormous expense, and be a source of such annoyance, that the Vestry hope the Metropolitan Board will resist them, even to refusing a constant supply on such vexatious conditions." The Vestry of S. George's-in-the-East have also agreed to a similar resolution.

SCIENCE AND ART DEPARTMENT.—The Lords of the Committee of Council on Education having, by a minute, dated the 3rd day of January, 1868, offered prizes, viz.:—One sum of £50, three sums of £40, five sums of £30, ten sums of £20, and twenty sums of £10, to the head masters of the schools of art in the United Kingdom in which the general amount of work, considered with reference to the number of students under instruction, should be found after the examinations to be most satisfactory; and having had the results of this year's examination laid before them, awarded the above prizes as follows:—Louisa Gann, Bloomsbury, £50; John Parker, S. Martin's, £40; Charles D. Hodder, Edinburgh (male), £40; A. A. Bradbury, Hanley, £40; W. J. Muckley, Manchester, Royal Institute, £30; D. W. Raimbach, Birmingham, £30; J. P. Bacon, Stoke-upon-Trent, £30; J. S. Rawle, F.S.A., Nottingham, £30; William H. Sounes, Sheffield, £30; John Anderson, Coventry, £20; George A. Stewart, West London, £20; Robert Greenlees, Glasgow, £20; T. C. Simmonds, Derby, £20; John Sparkes, Lambeth, £20; W. H. Stopford, Halifax, £20; Edward R. Taylor, Lincoln, £20; Wm. Cosens Way, Newcastle-upon-Tyne, £20; R. C. Pucket, Ph.D., Leeds (Mechanics' Institute), £20; W. C. Way, Sunderland, £20; John Kemp, Gloucester, £10; S. F. Mills, S. Thomas's Charterhouse, £10; J. C. Thompson, Warrington, £10; M. Sullivan, Kendal, £10; T. M. Lindsay, Belfast, £10; Susan A. Ashworth, Edinburgh (female), £10; Joseph Harris, Salisbury, £10; A. Stevenson, Keighley, £10; John Bentley, Birkenhead, £10; Joseph Kennedy, Aberdeen, £10; E. Stanley Burchett, Westminster, £10; G. Theaker, Burslem, £10; David Jones, Dudley, £10; A. Fisher, Brighton, £10; C. Swinstead, North London, £10; S. F. Mills, Spitalfields, £10; Edwin Lyne, Dublin (Royal Society), £10; John N. Smith, Bristol, £10; James B. Birkmyer, Exeter, £10; Z. Pritchard, Manchester (Grammar School), £10.

THE LARGEST BONDED WAREHOUSE IN LONDON.—The Japanese Ambassador and suite on Tuesday inspected "Butler's Wharf," Shad Thames (the largest bonded warehouse in the Port of London), and spent several hours in traversing the floors and examining the various classes of goods stored. They expressed their admiration of the new warehouses, and seemed much interested in watching the building works in progress, having ascended to the highest scaffolding for the purpose. This wharf has a frontage of over 500ft., or about one-tenth of a mile, on the river, with a landing stage the whole length for large steam vessels. The storage area exceeds ten acres. At the close of the inspection, F. L. Hutchins, Esq. (Murray & Hutchins, Birchin-lane), introduced the architects, Messrs. Tolley & Dale, who handed a perspective view of the wharf and buildings to the visitors.

ROME.—The *Zeitschrift fur bildende Kunst* of October 25, states that Signor Rosa's excavations in the Roman Forum have been crowned with the most brilliant success. About the beginning of September a portion of a Roman bas-relief was found at the corner where rises a middle-age tower. At two different portions of this tower (to which they appear to have served as supports hidden by other material) are now disclosed a row of portions of wall occupying from twelve to fifteen metres, decked on both sides with costly sculptures, which have apparently served for the decoration of the rostrum. These marble reliefs would display to the eyes of the people standing below a historically arranged series of notable events having relation to the Forum. The position in which they have been found opens a fresh field to topographical conjecture and inquiry, whilst the reliefs are of the greatest importance, not only on account of their historical content, but on account of the brilliant quality of their execution, which appears to belong to the last bright epoch of Greek art in Rome. It is proposed to send the reliefs to the Vienna Exhibition.

SOCIETY OF ENGINEERS.—The annual general meeting of the society was held on Monday evening last, for the election of the Council and officers for the ensuing year, Mr. Jabez Church, President, in the chair. After the usual routine business of the meeting had been disposed of, the balloting lists were handed to the scrutineers, who ultimately reported that the choice of the members had fallen on Mr. Church as President (who was thus unanimously elected a second time to that position); Messrs. J. H. Adams, W. MacGeorge, and V. Pendred, as Vice-Presidents. Eight other members of Council were also elected. Mr. A. Williams was re-elected Hon. Secretary and Treasurer, and Mr. J. Walker was elected Auditor. It was announced that the Council had awarded premiums of books to the following members, for papers read by them during the past session, viz.:—Mr. E. G. Bartholomew, Mr. W. H. Fox, and Mr. H. Davey. A cordial vote of thanks was passed to the President and Council for the past year, as well as to the Secretary, the acknowledgment of which closed the proceedings.—At a meeting held on Monday week, Mr. Jabez Church, President, in the chair, Mr. W. H. Fox read a paper "On Continuous Railway Brakes." The author, in the first place, considered the conditions which a continuous brake should fulfil, and which he set forth in detail. He then investigated the retarding force required to stop a train within a given distance, which, he showed, varied greatly under the varying conditions of railway traffic. His general conclusion, however, was that a retarding force of 18 per cent. of the weight of a train travelling at the rate of sixty miles per hour would stop it within a distance of 220 yards in ordinary weather. The author then discussed the question of wood *versus* cast-iron brake blocks, his opinion being that cast iron blocks were the better of the two, because with them the friction was more constant than with wood blocks, and was higher in foggy and wet weather, when brake power was most needed. Mr. Fox then went on to describe, by the aid of a set of elaborate diagrams, the chain brake of Messrs. Wilkin & Clarke, and the hydraulic brake of Mr. Barker, pointing out the relative advantages and disadvantages of each system. The author considered that every locomotive and carriage should be fitted with sufficient brake power to enable a train running at the rate of sixty miles per hour, on a level line, to be brought to a state of rest within a distance of 220 yards in ordinary weather. He further advocated the interference of the legislature in compelling this, on the score of public safety. The limits of a paper not permitting the author to describe all the systems of brakes in practical operation, he observed that having been able to describe only the chain and hydraulic brakes, he reserved descriptions of the atmospheric and electric brakes for a second paper. An animated discussion followed the reading of Mr. Fox's very practical paper, in which several railway engineers and others interested in the promotion of public safety in railways took part.

BELFAST ARCHITECTURAL ASSOCIATION. — A meeting of the above society was held at the Museum on Monday evening, 9th inst. There was a large attendance of members, Mr. Thomas Turner in the chair. An interesting paper was read by Samuel P. Close, A.R.I.A.I., on "Measured Drawings," showing the advantages to be gained by the measuring up, and close study of, good examples of ancient architectural work. The paper was illustrated by a large number of admirable drawings. Some of the members present added considerably to the interest of the evening's proceedings by discussing various matters connected with the above subject.

IPSWICH SCHOOL BOARD.—At the meeting of this board on Friday week Mr. Smith, builder, attended to inform the Board that he had made a mistake in his tender for the erection of the California and S. Clement Schools. The Board ultimately resolved that the motion of last week receiving the tender of Mr. Smith for the erection of Trinity-street School he rescinded, and that the next lowest tender—Mr. Cunnold's—for £689, be accepted, and that the tender of Mr. Luff, for the erection of California School for the sum of £993 10s. be received.

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MEETINGS FOR THE ENSUING WEEK.

MONDAY.—ROYAL INSTITUTE OF BRITISH ARCHITECTS.—"On the Old Halls in the Neighbourhood of Manchester." By C. H. Heathcote, Associate. 8 p.m.

TUESDAY.—INSTITUTION OF CIVIL ENGINEERS.—Annual General Meeting. 8 p.m.

WEDNESDAY.—SOCIETY OF ARTS.—"On Russia: her Industries, Commerce, and Means of Communication." By Professor Leone Levi. 8 p.m.

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CHIPS.

The Manchester School Board have decided on selecting six architects to compete for the new schools they purpose to erect.

New York is to have an Industrial Exposition that is to be permanent, and a Crystal Palace is to be erected for the purpose near Central Park, a lot having been bought for 1,700,000 dols. General Dix and other leading men have the project in charge.

A new chapel at the Brentford Union was opened for divine worship on the first Sunday in Advent. The chapel is built to accommodate about 300. The chancel, the space in front, and the passage down the nave are neatly paved with encaustic tiles.

The partial strike of the labourers employed in the erection of the new Town Hall, Albert-square, Manchester, is at an end. All the men, with very few exceptions, have returned to work, after being on strike for one day. Their demand of ½d. per hour advance in their wages was not acceded to, but ¼d. more per hour to skilled workmen was granted.

A piece of ground measuring 30ft. by 18ft. in a narrow-street abutting on Cheapside, has just been let at a rental of nearly £160 per annum. This is the more remarkable, as any building erected on the ground can only have light from the front.

Trade News.

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TENDERS.

BRIGHT WALTHAM.—For the erection of a new rectory house at Bright Waltham, for the Rev. H. F. Howard, exclusive of bricks and the materials of present rectory. Mr. Edwin Dolby, architect, Abingdon:—

Bryan (accepted)	£2396

BURMARSH.—For the erection of a new rectory house at Burmarsh, for Rev. H. C. Brockhardt. Plans by Messrs. Whitley & Fry, architects and surveyors:—

Edward (accepted)	£300

CAMBRIDGESHIRE.—For erecting schools at Benwick, Cambridgeshire. Mr. William Smith, architect, John-street, Adelphi, London:—

Phillips	£1663	5	4
Hutchinson	1439	0	0
Downs	1400	0	0
Bennett	1390	0	0
Bennett Bros.	1260	0	0
Swann (accepted)	1240	0	0

CAMBRIDGESHIRE.—For building a new rectory house at Benwick, Cambridgeshire. Mr. William Smith, architect, John-street, Adelphi:—

Fast	£2065
Bennett	1880
Bateman (accepted)	1844

HARPENDEN.—For the erection of a house at Harpenden, Herts, for Mr. Jas. Mardell. Mr. J. Shilock, architect:—

Wells (accepted)	£850	2	0

HOLLOWAY.—For the erection of schools in Cottenham-road, Holloway, for the School Board for London. Mr. Lacy W. Ridge, architect. Quantities by Mr. L. C. Riddett:—

Newman & Mann	£7249
Nightingale	7189
Williams & Son	7160
Wicks, Bangs, & Co.	6980
Roberts	6944
Adamson & Son	6941
D. King & Son	6892
High	7690
Patman & Fotheringham	6710
Niblett & Son	6630
Scrivener & White	6471

IPSWICH.—For the erection of S. Clement's Infants' School, Ipswich, for the Ipswich School Board:—

Bennett	£855	0	0
Mirfey	850	0	0
Girling	759	0	0
Gibbons	725	0	0
Cunnold	689	0	0
Smith (accepted)	582	9	0

IPSWICH.—For the erection of S. John's School, California, Ipswich:—

Gibbons	£1248	10	0
Girling	1223	0	0
Bennett	1014	0	0
Cunnold	997	0	0
Luff	993	16	6
Smith (accepted)	657	16	6

LINCOLNSHIRE.—For erecting schools at Weston-hills, Lincolnshire, Mr. William Smith, architect, 10, John-street, Adelphi, London:—

Moore (accepted)	£499

LINCOLNSHIRE.—For erecting schools at Spalding Marsh, Lincolnshire. Mr. William Smith, architect, John-street, Adelphi, London:—

Moore (accepted)	£598

LONDON.—For the erection of a warehouse in S. Bride-street, Ludgate-circus, London, E.C. (exclusive of fittings). Mr. H. H. Bridgman, architect:—

Perry & Co. (late)	£2250
Browne & Robinson	2209
Kelly Brothers	2173
Crockett	2045
Falkner	1996
Scrivener & White	1954
Elkington*	1939

* Amended tender (additional roof story), £2025 net, accepted.

LONDON.—For additions to "The Castle," Woodside, near Torrington Park Station, for W. B. Jones, Esq.:—

Blease	£890
Lewis	846
Holding	799
Strange	791
Hingston	749
Petley	725
Jackson	723
Webster	650
McLean	647
Kelly	620
Watkins	610
Pryors Brothers	580
Warr	535
Bulford	364

WILDERSPOOL.—For addition to the Brewery at Wilderspool, for Messrs. Greenall & Co. Mr. R. Davison, architect. Quantities by Messrs. Curtis & Son:—

Wright	£4960	0	0
Gibson & Son	4830	0	0
Collin & Son (accepted)	4399	4	0

WANDSWORTH.—For the erection of a house in Portinscale-road, Wandsworth, for W. H. Withall, Esq. Messrs. Lee Brothers & Pain, architects. Quantities supplied:—

Aries	£2175
Pain	2170
Thompson	2075
Aviss & Co.	2048

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES, Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

COMPETITIONS OPEN.

BIGGLESWADE.—For designs for altering and enlarging the Town Hall and Offices. A premium of 20 guineas will be given for the best design.—Mr. T. J. Hooper, Solicitor, Biggleswade, Beds.

CARLISLE PUBLIC HALL COMPANY, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

CHESTER UNION, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

CROWLE (Lincolnshire), January 1, 1873.—For plans, accompanied by specifications and estimates, for school buildings to accommodate 175 boys, 175 girls, and 100 infants. A premium of £5 will be given for the best and most economical plan.—Mr. T. T. Pearson, Clerk to the School Board, Crowle.

LLANELLY SCHOOL BOARD, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £3 per head. A premium of £15 will be paid for the plan approved of.—Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

THE CARLISLE DIOCESAN CHURCH EXTENSION SOCIETY, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs. This competition is open to architects residing in Cumberland, Westmoreland, and Lancashire only.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

THE NORTHAMPTON SCHOOL BOARD, January 27, 1873.—For designs for two new schools, with class-rooms and out-offices. One of the schools is to be built in Spring-lane, and is to accommodate 650 children; the other in Vernon-terrace, and is to accommodate 500 children. The architect whose design shall be selected will be appointed to superintend the erection of the buildings.—Mr. J. B. Hensman, Solicitor, Northampton; Offices of the Board, 6, S. Giles-street.

VIENNA, December 31.—For designs for a monument to the memory of the late Vice-Admiral Tegetthoff. Prizes of £300, £200, and £100 to be awarded to the three best designs.—The Committee of the Tegetthoff Monument, Vienna.

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

BERWICK HARBOUR, December 23.—For the construction of a wet dock and other works.—Messrs. D. & T. Stevenson, Engineers, 84, George-street, Edinburgh.

BLACKBURN, December 23.—For the supply of labour and materials to the Corporation.—Mr. C. G. H. Beck, Town Clerk, Town Hall, Blackburn.

BOROUGH OF LEEDS, December 21.—For horse hire for street-sweeping machines, water-carts, and scavenging-carts; and for watering Hunslet, Bramley, and Stanningley for six months.—Mr. C. A. Curwood, Town Clerk, Leeds.

BRADFORD (Shipley Fields Estate), December 21.—For the erection of thirteen houses in Aireville-road.—Messrs. Hope & Jardine, Architects, Exchange-buildings, Bradford.

BRITISH COLUMBIA, January 15, 1873.—For the construction of the Esquimalt Graving Dock.—Mr. G. U. Walkem, Chief Commissioner, Land and Works, Victoria, British Columbia.

CAERSALEM, December 27.—For enlarging and improving the Baptist Church.—Mr. Llewellyn Davies, Bryngelly House, near Swansea.

GREAT WESTERN RAILWAY, December 18.—For the construction of a goods warehouse and bonded store at Hockley, near Birmingham.—Mr. F. G. Saunders, Secretary, Paddington Station.

HAVERFORDWEST, December 16.—For the erection of boys', girls', and infant schools, outbuildings, and boundary walls. Also master's and mistress's residences, &c., to be built at Prendergast.—Michael White, Clerk to the Board, Haverfordwest.

HAVERFORDWEST, December 16.—For the works required in the erection of boys', girls', and infant schools, &c., at Prendergast, for the Haverfordwest School Board.—Mr. T. P. Reynolds, architect, Hill-street, Harverfordwest.

HUDDERSFIELD SCHOOL BOARD, December 30.—For the erection of Lindley Oaks School.—Mr. C. Fowler, Architect, 35, Estate-buildings, Huddersfield.

KINGSTON-UPON-HULL SCHOOL BOARD, December 16.—For the erection of a block of school buildings in Daltry-street.—D. J. O'Donoghue, Clerk to the Board, Town Hall, Hull.

LEEDS, December 17.—Contract No. 2: For the construction of two forty horse-power engines, machinery, pumps, girders, columns, tanks, &c. Contract No. 3. For the erection of mill, boiler-house, engine-house, &c.—Alfred M. Fowler, C.E., Borough Surveyor, Town Hall, Leeds.

LEEDS, December 19.—For the erection of a new drying kiln, and for raising a malt kiln another story. Messrs. Wilson & Bailey, Architects, Central Market-buildings, Leeds.

LONDON AND NORTH-WESTERN RAILWAY, Dec. 17. For taking down a portion of the existing passenger station at Macclesfield, and building a new one on the site.—District Engineer's Office, Crewe.

LONDON AND NORTH-WESTERN RAILWAY COMPANY, December 18.—For the construction of a new engine-shed at Carnforth.—Mr. S. B. Worthington, Engineer's Office, Victoria Station, Manchester.

METROPOLITAN BOARD OF WORKS, December 19.—For the erection of stone walls and iron fencing on the Victoria Embankment.—Mr. J. W. Bazalgette, Engineer to the Board, Spring-gardens, S.W.

MIDLAND RAILWAY, December 16.—For the construction of additional cellars under the S. Pancras Station.—Mr. Swain, Engineer's Office, S. Pancras Goods Station.

NARBERTH ROAD AND MAENCLOCHOG RAILWAY, December 16.—For the construction of a single line of railway, with approaches, conveniences, &c., from the Great Western Railway to Rosebush Slate Quarry.—Mr. M. T. Macdougall Smith, 1, Chapel-place, Duke-street, Westminster, S.W.

ROSS SCHOOL BOARD, December 18.—For the erection of schools to accommodate 420 children.—Mr. Rudge Rootes, Bank Offices, Ross.

SHIPLEY FIELDS ESTATE (near Bradford), Dec. 21.—For the erection of a terrace of twelve houses in Aireville-road, Frizinghall.—Mr. George Smith, Architect, 9, Market-street, Bradford.

SKIPTON WATERWORKS, December 30.—For the construction of a storage reservoir and other works.—Mr. J. Varley, C.E., Swadford-street, Skipton.

SKIPTON WATERWORKS, December 30.—For the delivery, at the Skipton Railway Station, of 12in. iron pipes, &c., to be cast vertically.—Mr. J. Varley, C.E., Swadford-street, Skipton.

SMALLBRIDGE, December 21.—For tenders and specifications for an organ for the Congregational Church.—Mr. Isaac Schofield, S. John's-terrace, Smallbridge, near Rochdale.

SOHO, December 20.—For the erection of a new school in Crown-street, and a new north aisle to S. Mary's Church.—Messrs. Slater & Carpenters, Architects, 4, Carlton-chambers, 4, Regent-street, Waterloo-place, S.W.

STAFFORD, December 26.—For alterations and additions to the Shire Hall.—Mr. R. Griffiths, Architect, 57A, Greengate-street, Stafford.

THE LEEDS TRAMWAYS COMPANY, December 21.—For paving a portion of the Headingley-road.—Engineer's Office, 3, Park-row, Leeds.

TODMORDEN, December 24.—For the erection of the United Methodist Free Church and school.—Mr. E. Potts, Architect, Clegg-street, Oldham.

WAR DEPARTMENT CONTRACTS, December 18.—For laying on gas to Christchurch Barracks.—Colonel R. Burnaby, Royal Engineer Office, Portsmouth.

WAR DEPARTMENT CONTRACTS, December 31.—For the performance of works and repairs, and supply of building materials, to War Department buildings and property at Ashton-under-Lyne and Manchester.—Commanding Officer, Royal Engineer Office, 12, Princes-street, Cornbrook, Manchester.

◆

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BANKRUPTS.

BANKRUPTCY ANNULLED.

James Judd, Turnham-green, builder, Nov. 26.

TO SURRENDER IN THE COUNTRY.

John Creser, York, painter and paperhanger, Dec. 18, at York.—John Keyworth Sharpe, Lincoln, builder, Dec. 16, at Lincoln.

SITTING FOR PUBLIC EXAMINATION.

Jan. 15, T. Bridges, Cirencester, formerly builder and contractor.

DIVIDEND MEETING.

Dec. 20, T. Witt, Stoke Damerel, engineer.

SCOTCH SEQUESTRATION.

Thomas Inglis, Glasgow, civil engineer, Dec. 19, at 12.

◆

PARTNERSHIPS DISSOLVED.

J. B. & W. Hamilton, Glasgow and Lombard-street City, iron and metal merchants.—A. Charlton & Co., Halesowen, nail and chain manufacturers.—Dobson & Brown, Mile End-road, architects and surveyors.—Harwood & Fairles, South Shields, builders.—M'Quhae & King, New Windsor, timber merchants.—Jebson & Tesh, Sheffield, builders.—Frazier & Ireland, Birmingham, iron and brass founders.—Farmer, Evans, & Co., Birmingham, plumbago crucible manufacturers.—Arthur Speight & Sons, Leeds and elsewhere, stone merchants.

◆

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.

Pig—Foreign	per ton	£20 17 6	£21 0 0
" English W.B.	do	22 0 0	22 15 0
" Lead Co.	do	22 12 6	0 0 0
" Other brands	do	21 10 0	21 15 0
Sheet Milled	do	22 5 0	22 15 0
Shot, Patent	do	24 10 0	0 0 0
Red or minium	do	23 5 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry	do	27 10 0	30 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.

British—Cake & Ingot	per ton	£89 0 0	£93 0 0
Best Selected	do	92 0 0	95 0 0
Sheet	do	93 0 0	100 0 0
Bottoms	do	95 0 0	104 0 0
Australian cake	do	89 0 0	90 0 0
Spanish Cake	do	86 0 0	0 0 0
Chili Bars, cash	do	82 10 0	86 0 0
" Refined ingot	do	88 0 0	93 0 0
Yellow Metal	per lb.	0 0 7¼	0 0 8¼

IRON.

Pig in Scotland, cash	per ton	£3 15 3	£0 0 0
Welsh Bar, in London	do	10 15 0	11 10 0
" Wales	do	9 10 0	10 5 0
Staffordshire	do	11 0 0	12 0 0
Rail, in Wales	do	10 0 0	10 10 0
Sheets, single in London	do	14 10 0	16 0 0
Hoops, first quality	do	12 0 0	14 0 0
Nail Rod	do	11 10 0	12 0 0
Swedish	do	16 0 0	17 0 0

OILS, &C.

Seal, pale	per tun	£38 0 0	£39 0 0
Sperm body	"	88 0 0	0 0 0
Cod	"	39 0 0	0 0 0
Whale, South Sea, pale	"	38 10 0	39 0 0
Olive, Gallipoli	"	47 0 0	47 10 0
Cocoanut, Cochin, tun	"	36 0 0	39 0 0
Palm, fine	"	39 0 0	0 0 0
Linseed	"	33 10 0	0 0 0
Rapeseed, Eng. pale	"	0 0 0	0 0 0
Cottonseed	"	32 0 0	0 0 0

TIMBER.

Teak	load	£14 10 0	£15 10 0
Quebec, red pine	"	3 10 0	5 0 0
" yellow pine	"	3 5 0	6 0 0
Quebec oak, white	"	6 10 0	7 0 0
" birch	"	5 0 0	6 0 0
" elm	"	4 15 0	5 0 0
Dantzic oak	"	4 0 0	6 10 0
" fir	"	2 10 0	6 0 0
Memel fir	"	3 5 0	4 10 0
Riga	"	4 0 0	4 5 0
Swedish	"	2 15 0	3 0 0
Masts, Quebec red pine	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	9 0 0
Lathwood, Dantzic, fm.	"	8 10 0	9 10 0
" St. Petersburg	"	9 10 0	11 0 0
Deals, per C., 12ft. by 3 by 9in.,			
Quebec, white spruce	"	14 10 0	21 0 0
St. John, white spruce	"	14 10 0	18 0 0
Yellow pine, pr reduced C			
Canada, 1st quality	"	22 0 0	24 0 0
" 2nd do	"	15 10 0	16 10 0
Archangel, yellow	"	14 10 0	15 10 0
St. Petersburg, yellow	"	12 10 0	13 10 0
Finland	"	7 10 0	8 10 0
Memel and Dantzic	"	0 0 0	0 0 0
Gothenburg, yellow	"	10 10 0	13 0 0
" white	"	10 0 0	13 10 0
Gefle, yellow	"	12 0 0	13 10 0
Soderham	"	0 0 0	0 0 0
Christiania	"	0 0 0	0 0 0
Other Norway	"	8 10 0	9 10 0
Flooring boards, pr square of 1in., first yellow	"	0 11 0	0 12 6
First white	"	0 9 6	0 11 6
Second qualities	"	0 7 0	0 10 0

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 20, 1872.

SANITARY REPORTS.

THE accidental perusal of a series of admirable sanitary reports addressed to the Vestry of Paddington by their energetic Medical Officer of Health, Wm. Hardwicke, M.D., Deputy Coroner for Central Middlesex, has impressed us with a somewhat melancholy sense of the time and trouble it takes to ensure a reception of sound principles upon subjects of vital importance to the community, and of the practical difficulty of getting them carried into effect. Time after time powerful blows are directed upon the head of some obstinate nail with little apparent success in driving it home, and yet one here and one there, by dint of oft-repeated effort, gets planted securely, and thereby offers encouragement to continue the endeavour. A good deal of matter valuable to our readers may be extracted from the terse remarks and cogent reasoning which these short but valuable reports contain, and we propose therefore to extract some few passages for their benefit, and use them as texts for our present discourse.

In page 27 of the Report for 1870-71, Dr. Hardwicke remarks, " A *Building Act* ought at least to guarantee that houses should be erected with due regard to all the essential conditions for securing health, both in the structure itself, its foundations and surroundings, also for ventilation, drainage, and water-closet accommodation. The new buildings of this parish are not so flimsy as many that I could name, but few of the new houses are massive and firm ; some are built upon garden mould or old 'slop shoots.' These thin and flimsy shells of lath and plaster truly merit the term 'slop buildings.' A dangerous moisture and miasma arises from houses built upon such an unhealthy foundation. There ought to be clauses sufficiently stringent to prevent the mortar used both for building and for the plaster of walls from being made of slop refuse or road scrapings, which contain nearly 20 per cent. of animal excrement." We meet here with testimony from one capable of judging of the practical results of a system which of course would be theoretically condemned by professional men, whose advice is often objected to as hypercritical. There can, indeed, be little doubt that the tables of mortality which accompany this report have been unduly swelled by diseases engendered by the unwholesome exhalations from such foundations and materials as those objected to, drawn out by the heat of the inhabited interiors. When will the State awake to the fearful injury inflicted upon the public by the greed of the speculating builders into whose hands it consigns the erection of the homes of the population?

While upon this subject, we turn to page 25 of the second report of the next year 1871-72. " Numerous complaints reach me of nuisances on the vacant building plots in the north-west parts of the parish. Instead of attractive to a class of respectable persons, this suburb of London, being now regarded as one of the healthy and open parts, will soon be characterised as one of the worst and most repulsive, unless precautionary measures are taken." After commenting upon stagnant pools, he says : " Another evil arises from the practice of filling up ground with road scrapings and 'slop-shoots.' This is highly objectionable, inasmuch as the scrapings of macadam and gravel roads contain a sufficiently large proportion of organic matter, in the form of horse dung, to evolve for some time smells from impure gases. . . . Basements of houses will, for a long time after they have been erected, have a *mouldy* smell if built upon this made ground. Slop should not be allowed within the foundations or interiors of a house, which ought to be only of concrete, dry builders' rubbish, or cinders." It is perfectly impossible that such suburbs as these, which may be considered as the rule rather than the exception, not only around London, but near all our large towns, can be healthy, and the evil is aggravated by the constant use of filthy refuse, the siftings of dust-heaps, with broken crockery and scraps of all kinds for the *cores* of the roadways. It is but the other day that some material of this class was carted into one of the principal streets in Westminster to fill up the excavations for a sewer, when, from its offensive smell, it was hastily buried in the trench, so as to be out of sight and smell. To remedy the evils arising from overcrowding and the want of space in the tenements of the poor to accommodate the corpses of the dead, except among the living, Dr. Hardwicke has proposed, on more than one occasion, the establishment of a parochial deadhouse and mortuary, in order that decency may be preserved. He further very properly urges " that some pretentions to ecclesiastical architecture and architectural ornament be observed to induce people to place the bodies of their deceased relatives in these buildings." We find this advice given in the report for 1867-68; and again in the following year he returns to the charge, when we perceive a resolution had been passed by a committee so far approving the idea that Dr. Hardwicke says : " It is, therefore, probable that in Paddington the intentions of the Legislature will sooner or later be carried out."

Among other improvements we find public baths and contiguous laundries suggested with forcible argument, and the probability of such establishments becoming self-supporting, and therefore a good investment of capital, is pointed out. The desirability of their compulsory use is thus referred to : — " When public baths and washhouses exist, it should no longer be permitted to carry on family washing, either in a single room or in a house where more than one family resides. I have long since been convinced that nothing is more prejudicial to health than the living room converted into, or closely contiguous to, a washing-place."

Public work-rooms are recommended as a remedy for evils of which a description is given, and which are consequent upon the overcrowded state. A number of small compartments or rooms, well lighted and ventilated, would certainly tend to the preservation of health among many classes of artisans, and we doubt not could be profitably leased at small weekly rentals. Of the density of population in the parish of Paddington some valuable statistics are presented in some of the reports, the average in several localities approaching 500 persons to the acre! and by the comparison made of the details of the mortality of these places with others, the advantages of higher civilisation upon health and longevity is pointed out.

The above extracts will serve to show how valuable is the out-spoken opinion of public officials, whose labour, if it seem to lead to small result, is yet like bread cast upon the waters. The author is pardonably impatient of the slow progress of sanitary reform, upon which he has dilated in a paper upon " The Evils of Over-crowding in the Dwellings of the Poor," read before the National Association for the Promotion of Social Science in 1863. Still we believe that since that date many of the remedial measures he then recommended have been put, at least, into partial operation with very appreciable and satisfactory results. Far more, however, needs to be done ; truly the harvest is ready, and we should gladly welcome all such zealous labourers in the field as Dr. Hardwicke himself, and we look forward with pleasure to a paper he has promised to read before the National Health Society, in the month of February next, with the purpose of illustrating further steps which should now be taken to hasten and widen the good work.

WATER POWER.—V.

EXPERIMENTS on the actual quantities of water issuing from openings of known areas and forms show that those quantities are in all cases less than those which are due to the areas of the openings multiplied into the velocities due to the several heads of water, calculated upon the known effects of the power of gravity, which give in any particular case the quantity or the velocity which is called the theoretical quantity or the theoretical velocity. But taking the velocity so found in feet per second—viz., eight times the square root of the head of water in feet, as a standard, coefficients of diminution have been found for various forms of opening, which show the ratio between the theoretical velocity and that which may be called the mean velocity of all the filaments of water issuing through any actual opening. The more abrupt the outlet the less is the coefficient of actual velocity, or, as some say, the co-efficient of contraction. Whether one or the other of these expressions is the more proper depends upon the form of the opening, the area of which is measured and multiplied into the coefficient to find the actual discharge. With abrupt openings the diminution may more properly be attributed to the contraction of the vein outside the opening, and with openings which have converging side walls the diminution should be attributed to the reduction of velocity caused by the friction of the particles of water amongst themselves and against the side walls. Generally, the velocity is found by measuring the actual quantity of water discharged in a given time, and dividing it by the area of the opening through which it issues. In making these experiments the water is discharged into a tank of known capacity, and the time of filling is accurately noted. From experiments conducted in this manner coefficients are found which make theoretical deductions accord with observations of facts.

There is another method of ascertaining the velocity by actual measurement. It is known that a heavy body issuing into the atmosphere with an initial velocity at some height above the ground describes in its descent a parabolic curve nearly, and would do so exactly if the air were removed. If an experimental vessel with a hole in its side near the bottom be set up at some height above the ground, and if a vertical line be let fall from the mouth of the orifice to a horizontal plane at any depth below it, and if horizontal lines be measured out from the vertical line to the jet at several points, then these ordinates, measured at the points of corresponding abscissæ, show the jet to describe a parabolic curve nearly. If h be put for the head of water above the centre of the orifice, which is due according to the theory of falling bodies to the initial velocity of the issuing jet, and if x = the length of any abscissæ and y its corresponding ordinate, then $y^2 = 4hx$. By measurements in this way Bossut found at three different heights the value of h to be nearly that of the actual head of water. Calling the actual head H, the heads calculated from the range of jet at these several heights were as follow :—

When $H = 7{\cdot}511$ft., $h = 7{\cdot}404$ft.
,, $H = 12{\cdot}890$ft., $h = 12{\cdot}564$ft.
,, $H = 23{\cdot}583$ft., $h = 22{\cdot}720$ft.

The differences are due partly to the resistance of the air at high velocities, and partly to the viscidity of the water and consequent friction of its particles.

If we state the theoretical discharge or the theoretical velocity as = 1, the limits between which actual discharges and actual velocities vary are ·625 and 1 of those determined by the theory of falling bodies. By no form of construction can the actual discharge or the actual velocity reach the theoretical discharge or the theoretical velocity, because the theory assumes the falling body to fall *in vacuo*, and although the very great difference between the density of the atmosphere and any heavy body falling in it, or issuing into it, reduces its retarding influence to a very small opposing force, yet it has a degree of density, and its opposing force is inversely proportionate to the difference of density between itself and the body issuing into it. The quantity of water, therefore, or its velocity, issuing from any opening of whatever form can never quite reach that found by theoretical calculation.

Dr. Downing, Professor of Civil Engineering in the University of Dublin, in his "Practical Hydraulics," gives a table of experiments—apparently those made by Castel and D'Aubuisson — to determine the coefficient of discharge and that of velocity through short-truncated tubes, the sides of which converge at various angles. The length of the experimental tube was 2½ times the diameter at the outer end. See Fig. 6.

The angle that gave the maximum discharge was between 13° and 14°, the ratio between the actual and the theoretical discharge being then as ·95 to 1, but it does not vary much on either side of the maximum within a range of about 5°; thus at 8° it is ·93, and the same at 18°, so that for quickness of discharge the angle may vary from 8° to 18°, with a mean coefficient of ·94 or thereabouts; but as the angle increases beyond about 18° the coefficient of discharge diminishes more rapidly, until at 48° it is but ·84, and if continued to the extremest angle of 180° would be about ·5. The coefficient of *velocity*, however, continues to increase with the angle, even beyond the angle of maximum discharge, where it is ·96, to 48°, where these experiments show it to be ·98. These experiments were made on the small scale, but three experiments made at a mill on the canal of Languedoc show similar results, as to discharge, through a truncated pyramidal tube of considerable dimensions. The length was 9·59ft., dimensions at larger end 3·2ft. by 2·4ft., at the smaller end ·623ft. by ·443ft. The opposite faces made angles of 11° 38′ and 15° 18′. The head of water was 9·69ft. The coefficients of discharge deduced from these three experiments on the large scale were ·987, ·976, and ·979 respectively, or very nearly the full theoretical quantity.

Eytelwein ("Handbuch der Mechanik und der Hydraulik"), translated by Dr. Thomas Young, and quoted in Tredgold's "Tracts on Hydraulics," gives the constant multiplier 7·8 for an orifice of the form of the contracted stream, that is when the internal edges of an orifice in a thick plank or a short tube are rounded off to that form, from which we deduce the coefficient ·97. When the internal edges are not rounded the coefficient is ·92.

The late Mr. Beardmore, in his "Tables to Facilitate Hydraulic and other Calculations," gives the constant 7·5 to be multiplied into the square root of the head of water, for the mean velocity in feet per second for openings such as these. The theoretical value is 8·03 $\sqrt{h}$, so that the co-efficient in this case would be ·934.

From the results of his own practice, which was considerable in this respect, Mr. Beardmore considered that the constant 7·5 was to be preferred for openings constructed as nearly as may be of the form of the issuing jet.

Adopting this constant, we may apply it to an example. If an undershot wheel be applied to utilise a fall of water of 4ft.—that is 4ft. head from the surface down to the centre of the opening of the sluice; and if the width of the sluice be 6ft., and the vertical height to which it is found necessary to raise the sluice-gate, in order to do the work required, be 6in.; the area of the opening would be 3 square feet, which call A; let h = the head of water in feet, then the mean velocity of all the filaments of water through that opening, supposing the side walls to be splayed, and the head of the sluice-gate sloped up-stream, would be 7·5 $\sqrt{h}$, and the quantity of water discharged would be 7·5 $\sqrt{h}$ × A = 7·5 × 2 × 3 = 45 cubic feet per second.

As to the best diameter of an undershot wheel and its speed, Sir W. Fairbairn states, in his "Treatise on Mill Work," that assuming 2·4 $\sqrt{h}$ to be the velocity of the extremity of the float-boards to give a maximum effect, and let N = the number of revolutions per minute, then the diameter, expressed in terms of the velocity and height of fall, will be $19{\cdot}1 \times \frac{2{\cdot}4\sqrt{h}}{N} = \frac{46\sqrt{h}}{N}$ nearly. For instance, if the fall be 4ft., and the number of revolutions 8 per minute, then the diameter $= \frac{46}{8} \times \sqrt{4} = 11\frac{1}{2}$ft. nearly.

The number 19·1 appears to be arrived at thus: N, the number of revolutions, is taken in respect of a minute, while the velocity 2·4 $\sqrt{h}$ is taken at per second. The number of seconds in a minute (60) divided by 3·1416, the ratio of the circumference of a circle to its diameter, = 19·1.

FIG. 6

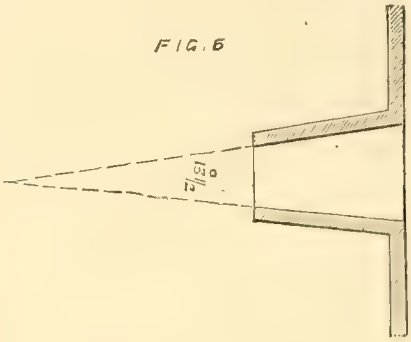


FIG. 7

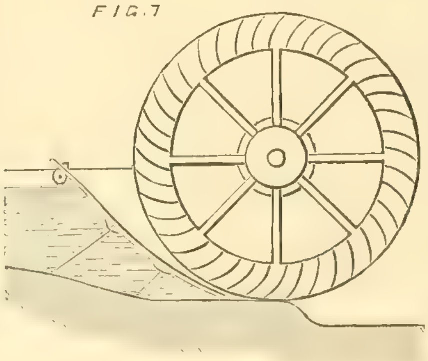
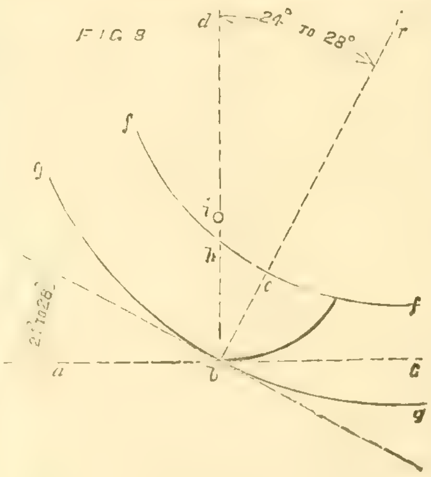


FIG. 8



Other authorities give the best speed of an undershot wheel as half that of the water; others again as $\frac{57}{100}$ of that the water. Now there is an apparent discrepancy here, and it probably arises from the different values given to the coefficient of velocity of the issuing jet. According to the form of the opening, that velocity varies from 5 $\sqrt{h}$ to 7·5 $\sqrt{h}$, being least with abrupt openings and greatest with openings of the form of the *vena contracta*, or with trained walls and sluices. If the coefficient 5 be adopted, and the proper speed of the wheel be taken at half the velocity of the water, then the speed of the wheel would be 2·5 $\sqrt{h}$, agreeing nearly with Sir W. Fairbairn's statement above given; but with openings of the form to which it would be proper to apply the coefficient 7·5, the speed of the wheel (supposing it be likewise half that of the water) would be 3·75 $\sqrt{h}$. On the whole, it will probably be near the truth for ordinary cases to make the speed of the wheel in feet per second from 3 $\sqrt{h}$, to 3·5 $\sqrt{h}$, accordingly as the form of the opening varies either way from a form which would be a mean between an abrupt opening and one of the best form; the coefficient, or rather constant multiplier, being taken at from 6 to 7 for the velocity of the water, and the speed of the wheel at half that velocity.

The ratio of the useful effect, or work done, to the power expended on an undershot wheel is usually reckoned as but little more than 1 : 3. Thus, if the head of water be 4ft., the width of the opening 8ft., and its vertical height 6in., the area would be 4 square feet. The velocity of the water through the opening (supposing there to be converging side walls and sloping gate) would be 7·5 $\sqrt{h}$ = 7·5 × 2 = 15ft. per second, and the area being 4 square ft. there would be 60 cubic feet of water expended per second, or 3,600 cubic feet per minute, falling 4ft., which is the same power as (3600 × 4 =) 14,400 cubic feet, falling 1ft. in a minute. But as the ratio of the useful effect and the power is as 1 : 3 the effective force of this expenditure of water is $\left(\frac{14{,}400}{3} =\right)$ 4,800 cubic feet raised 1ft. high per minute. A horse-power being 33,000lb., raised 1ft. high per minute is also equal to $\left(\frac{33{,}000}{62{\cdot}5} =\right)$ 528 cubic feet of water raised 1ft. high per minute. Therefore the effective power of an undershot wheel applied to utilise this quantity of water with this fall would be $\frac{4{,}800}{528} = 9$ horse-power.

Sir William Fairbairn states that the usual range of diameters for undershot wheels is from 12ft. to 25ft. and that from 12ft. to 16ft. is considered to be most effective. In his own practice he has found from 14ft. to 18ft. diameter to give the best duty. The float-boards, instead of being set in a radial direction on the wheel, are sometimes set in an inclined direction, but this does not seem to increase the useful effect. The number of floats is usually $\frac{4d}{3} + 12$, d being the diameter of the wheel in feet. Thus, for a wheel 15ft. diameter the number of floats $= \frac{4 \times 15}{3} + 12 = 32$. The thickness of the vein of fluid may be from 6in. to 9in., and the depth of the float-boards from 18in. to 24in.

The greatest improvement on the undershot wheel has been made by M. Poncelet. His form of wheel is shown in Fig. 7. It has curved floats of sheet iron; indeed, the whole framework is of iron, and very light. It is well suited for low falls and large quantities of water, and can be driven at a greater speed than a low breast wheel, with which its performance is to be compared. Its useful effect is from 50 to 60 per cent. of the power of the water expended, and its speed from half to three-fifths of the velocity of the water. M. de Bergue exhibited at the Institution of Civil Engineers a drawing of one of these wheels erected by him 16ft. 8in. diameter and 30ft. wide, the fall of water being 6ft. 6in. The following is a method of describing the curve of the floats of M. Poncelet's wheel. Let $a\ b\ c$, Fig. 8, be a horizontal line, and $b\ d$ the perpendicular to it. Let $b\ r$ be the radius of the wheel, the divergence from the vertical being from 24° to 28°. Take $b\ e$ = from one-third to a quarter of the fall of water, and draw the inner circumference $f\ f$, and the outer circumference $g\ g$. Take on $b\ d$, $h\ i$ = one-sixth of $h\,h$, and from the centre i, with radius $i\,h$, describe the curve of the float. The number of floats is greater in this than in ordinary undershot wheels, and therefore the motion is more equable and continuous. Let d = the diameter of the wheel in feet, then for wheels from 10ft. to 20ft. diameter, the number of floats $= \frac{8\,d}{5} + 16$; thus for a wheel 15ft. diameter, the number of floats $= \frac{8 \times 15}{5} + 16 = 40$.

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CONVERSAZIONE AT THE ARTS CLUB.

On the evenings of the 11th and 12th a very pleasant meeting of the members of the Arts Club and friends took place in their building, 17, Hanover-square. Many of the leading artists of the day contributed their best works, a large proportion of which were never before exhibited, and many of the best known patrons of Art lent the almost priceless treasures in their possession. Works were to be seen which were never in a dealer's hands, and which the general public are never likely to see. Owing to the great value of the collection, and the risk of fire where gas in large quantities is used, it was thought prudent to collect the pictures at the last moment and return them as soon as possible. Through the zeal of Mr. A. C. Bell, and the exertions of the hanging committee, every picture was hung in a few hours, and by half-past eight, the hour fixed for the admission of guests, everything was ready. One room was devoted to the old masters, another to the modern school, a third to water-colours and photographs, and a fourth to photographs, of which there were many fine specimens. The most striking painting of the modern school was Millais' portrait of an old lady, a marvellous work, which for flesh tints and modelling has not been surpassed by any English artist, perhaps by no contemporary whatever. Overbeck, Piloty, or Kaulbach have produced nothing like it, and it is extremely doubtful if the French school ever will. Poor Regnault might, had he lived, but neither Gerome nor Fleury are likely to do so. F. Walker, an A.R.A. of last year, sent an important work, "The Wanderers," exhibited a few years ago in the Academy, and some others of rare merit. Three by the late G. Mason ; one in particular, a delicious little sylvan scene, perhaps the best of his works. Two extraordinary allegorical pictures by Rossetti, with undoubted brightness of colour, were too difficult of interpretation to be appreciated as they deserved. Two water-colours by J. H. d'Egville, notably a "View on the Venetian Lagunes," attracted great attention. A more delicate drawing, yet full of light and atmosphere, has never left this artist's easel. "A Dream within a Dream," by Jopling, a nude figure, suggesting Andromeda, was one of the most remarkable pictures. Field Talfourd, who, as his wont, is studying nature in Wales, had a charming water-colour of a Welsh bridge over a mountain torrent. V. Prinsep contributed a large figure painting, and Hook a fishing-boat under sail, in the act of being beached. Frere and W. W. Deane were represented by earlier, and perhaps better, specimens of their works than are usually seen. The bold, but beautifully-finished, drawings of architectural subjects, the Parthenon, &c., by Phené Spiers, were admired.

In a private gathering such as this the reporter's note-book were out of place, for which reason, and from the absence of a catalogue, many deserving works are neglected in this notice. Several artists who usually contribute their quota to the Annual Conversazione of the "Arts," did not do so this year. Leighton sent some curios, but Marks, Poynter, Orchardson, Fripp, Perugini, J. B. Burgess, who, by the way, is in Spain, and Marcus Stone, were unrepresented, but there were three pictures by the late F. Stone.

Of the photo.'s seven were by Blanchard and nineteen by Mrs. Cameron, all of unusual excellence. The most interesting feature of the Exhibition was the array of Oriental curiosities, Persian, Chinese, Japanese, and Syrian. This was no ordinary display, but the very pick of collectors' collections. Articles never seen in hong or bazaar, to say nothing of Wardour-street, might here be found. A Japanese ambassador sent his own swords and other personal effects, the like whereof are not to be matched at South Kensington. The scabbard of one of these swords was of black enamel, but enamelled on gold, no particle of which was visible. T. Blanford and Major St. John sent many rare Persian antiques. R. W. Edis, G. Aitchison, J. Davidson, M. Annett, M. Dilberoglue, W. Burges, H. W. Wood, and others furnished the Japanese contingent ; the last named lent a particularly curious vase of old Japanese bronze ; M. Dilberoglue a remarkable wood carving, a buck and doe, closely resembling modern Austrian work ; J. Davidson a Japanese doctor's travelling medicine case, perfectly unique ; and Phené Spiers a comic illustrated work of the greatest humour. Two Chinese swords, consisting of coins loosely strung together, of no possible use, emblems of office probably, we do not recollect to have seen before. F. Dillon sent certain interesting Syrian objects. To the energy of J. Davidson, a principal contributor, the organisation of this department was principally due. On Thursday evening ladies were received, and some pleasant hours passed. One of the Japanese ambassadors was invited, but from the very short notice which, from some unfortunate chance he received, could not attend. The rooms were filled to the utmost extent consistent with comfort to the guests and safety to the objects, and the unanimous opinion of guests and hosts alike was that the conversazione was a success from a social as well as an artistic point of view.

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ANIMAL LIFE AND FINE ART IN THE PAST AND THE PRESENT.

A THOUGHT IN THE CATTLE SHOW.

There is one special subject of difference between the antique art of the past and modern art that has as yet attracted but small, if, indeed any, adequate attention. One might almost say that it includes within it almost every important distinction between the two systems of artistic action. It is that of the different ways in which the every-day life and action of past times furnished to the artists, whether sculptors or painters, or decorators—for we must never forget them—of those days, constant and ever varying sources of subjects and "inspirations" for their several arts. Witness, for instance, the whole series of Assyrian sculpture in the British Museum galleries. All kinds of occurrences in every-day life are recorded, from warfare and sieges of cities to the commonest work of the ordinary artisan. Nothing came amiss to the old Assyrian artist workman. The same is, of course, to be said of the old Egyptian : nothing has been lost sight of or left unrecorded, from the most gorgeous and impressive of religious ceremonial to the simple vocation of the cattle drover : no *animal* life undrawn, from the largest to the smallest. We know the shape and colour of the domestic animals of the ancient Egyptians, as well as they did themselves, and here and there on wall sculptures and in wall paintings may be seen groups of cattle and animal forms nowhere to be surpassed for vigour of drawing and true expression of animal life. There are several examples of this great fact in the British Museum well worth the attention of the student, and which will help to call attention to one of the most momentous of art problems, we had almost said to the art of the future—to the true and perhaps only legitimate *key* to the fine art of the future the whole world over.

We are led to these thoughts, as every artist must be, or ought to be, by a visit to the well-known *Cattle Show*. Here we have collected together in a convenient but hardly *artistic* way—for this would seem to be entirely out of John Bull's line of business—the very best and finest of animal life which the wealth and skill of England can produce. It is quite certain that nowhere else in the world could there be expended so much money on the bringing into existence of fine animals as is to be seen in this great show. It is not a little curious, and significant of the ways and ambitions of English nature, that nearly all, nay all, the professional interest found to be manifested in this display of fine animal life centres itself in, if it be not wholly confined to, the "food-producing" powers of the said animals. We have tried some experiments, and have found it impossible to enlist attention to the *form* of an animal, irrespective of its "meat-producing" powers. Let us not be misunderstood. Of course, it is but to be expected that those interested in the rearing and sale of food-producing animals should most regard that special quality in them, and we can find no fault with it; but in a true *art-loving* people we might expect that such persons would be able to abstract this mere *useful* quality from their mental perception for a while, and look at the living form before them as fine developments of natural form, and as noble specimens of animal life. But it is not so here in this nineteenth century show! Did the antique Greek in the days of Homer and Phidias thus look at animal forms and movements? Surely not; it cannot have been so, else should we never have had the Greek sculpture as shown to us in the Phigalian and Athenian marbles. And not only must the old Greek have regarded the forms of animals with true artistic admiration simply as objects of beauty and majesty of form, but he was not contented with this only, he set himself to work, or set others to work, to *record* this impression made on his mind, and sought in enduring materials, in bronze and marble, to perpetuate them, and thus to have them always before him. It seems almost impossible to over-estimate this fine and true artistic faculty in the Greek race: a true race of artist men to look at as well as an equally true race of artist workmen to do the work. How is it possible too sufficiently, or too often, to admire the Greek, the glorious Greek, sculpture? One cannot help wondering how it is that Mr. Gladstone, with all his old love for Homer, the inspirer of Phidias, does not start a museum of pure Greek sculpture of his own, wherein at least the work of the antique workmen may be seen unmutilated, unrestored, and not hidden away under glass cases, *for these things realise the Greek records*, and the emphatic words of the old Bard embody themselves in actual form and presence. These considerations, and not a few more like them, may well force themselves on the mind of the artist whenever he comes across noble animal forms, such as in many instances he does, at the Islington Cattle Show. Let no one to whom this subject may seem a little strange dismiss it without a further thought. How the Greek recorded his impressions of fine animal life we know, but how does the modern scientifically and artistically-enlighted man in this wealthy age do the like work? for do something he most assuredly does and must do. It is worth recording if only to enlighten the future of art. Putting aside the record that is made year by year of our finest breeds of cattle in divers illustrated journals, and wherein, by the way, it is instructive to note the "meat-producing" element in the animals portrayed is so conspicuously visible, and to which all else is subordinate, producing *caricatures* almost of fat cattle, prize oxen, and half blind pigs, and sheep almost without legs,—we say, putting all this aside as a something somewhat pitiable, and certainly characteristically

British, there is yet another record going on which does the old Greek work in another way: in genuine oil and colours, on canvas and on panel, wonderful performances indeed. Let us take note of them. But a word of explanation as to modern animals, and as reared by modern men, before a word more on the modern way of recording their appearance, and before fine art steps in to aid in the matter. There is, without doubt, much gain by taking Nature in hand, and by the endeavour to *improve* her work, and very considerable advantage there must needs be in artificial foods and methods of feeding and housing and rearing animals. More meat is produced, doubtless, and much is saved, and so on, but one thing, as Goethe long ago noticed, is certainly to no small extent lost—viz., the *natural expression*, as it may well be termed, of the animal itself. All the native wildness (and all animals must have been wild at one time) disappears before management and domestication. All that well-nigh indescribable expression, and natural freedom, and grace of action and movement, seems to fade away, and eventually to die out of the magnificent animal nature in the well-ordered and comfortable stable; not that the animal beauty wholly disappears, for that is, happily, impossible, even under the most artificial surroundings; but the expression is altered, and becomes *tamer*. Nature is put out more or less. The wolf in time is content to lie down with the lamb, and it is certainly in the long run not the wolf that gets the victory, but the lamb. It *is* a victory, that is certain, but it is purchased at a great price. *Nature is subdued*, and that expression and character which Nature confers is deadened, and sometimes totally put out. It is a gain doubtless, but it is a loss too. A tamed lion is hardly a lion longer. An artist asking sight of a lion cannot see one in a close cage in a menagerie, and in this Cattle Show we may see with some clearness into the truth of this by comparing the Highland cattle with the famous "Devons" and other English breeds. Nothing can be finer as specimens of animal life than some of these animals. Their form, strength, rough coats, magnificent heads, and free natural movements, all go to make up the very perfection of animal nature. Nature it is that here does so much of the work, and Nature is the greatest and the best of artists. All the complicated and wonderful powers and forces which combine to make up creation, infinite as they are, aid in bringing into existence these magnificent effects. Animal life, or self-motive power, as Humboldt called it, would seem to be the last and great effort of the creative forces. And what is so truly marvellous, the ideas of beauty and grace form part of the great work. It is this that makes fine animal forms so interesting to the true artist and workman, as supplying them with ever new and fresh sources of inspiration and models of workmanship. They need never be at a loss, but to Nature they must go. It is in this way that this show of fine cattle must always be of absorbing interest, independent of mere utility, and it seems a pity that these shows cannot be made to divide themselves into two classes—*i.e.*, animals for use simply, and animals for perfection of form and colour, and animal strength and beauty and grace of movement—in short, of fine and noble animal life. That the old Greeks saw into this secret who can doubt? Their perception of the beauty of the *human* form must, as we see in the sculptures, have guided them to the perception of the same qualities in animal forms. The men, the horses, and the cattle in the Parthenon frieze are all of them equally remarkable for the display of the perfection of form and grace of movement. The horse and his rider fit each other. The one is worthy of the other, and no "anthropomorphic element" is needed to complete the work. The Greek well understood the work he had to do, he truly entered into the spirit of Nature, and saw his work fairly before him, what it was worth, and what he had to do, and what he must do *himself*, with his own hand and arm. A mighty enough problem—he fairly met it, and we yet may see his work! But we must not forget in the past the doings of the present. The Greek did his work with his horses and his cattle, and the modern man at the Cattle Show does his in his own way; he records the impressions made on him by the sight of fine animal life. Should you take special fancy to any particular beast in the Show, you may for a consideration have his or her "portrait" taken on canvas, or on panel, in oil colours. This work of cattle portrait painting may be seen in operation, and it always seems to us one of the most wonderful things that London can well boast of. There seems to be a positive genius at work in it—how *not* to draw an ox, or a cow—and how not to paint either him or her! Where the colours come from, who shall say? and it is not for us to speculate, for we may go wrong. It is thoroughly architectural, and geometric, too; for what you really do see and get, if you buy one, is a real and true "side elevation" of an ox! There is no mistake about it. It may be measured, and will be found correct. Where the life of the poor brute goes to may be a mystery, but it certainly is not on the canvas or panel; nor does oil colour seem to be the proper medium for it. It is quite wonderful, too, how the exaggerated "points" of the poor animal are caught and portrayed; a truly marvellous production, and of this nineteenth century. If any earnest art student, therefore, wants to see what it is to progress in fine art, and what it must have been to be an unlettered, unscientific, non-art-certificated Greek in the days of Pericles, and what it is to be a modern enlightened and progressive lover of art in these days, why he has but to travel from the British Museum collection of "old wares" to the Smithfield Club Cattle Show to find it out. Poor old Phidias drew Greek bulls on marble! We draw English bulls on canvas!

C. B. A.

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THE SHRINES IN S. ALBAN'S ABBEY.*

THIS is the title of a small quarto pamphlet just published, which we notice firstly, because the shrine basements or pedestals lately discovered are of great architectural interest; secondly, because there are very few people who have a perfectly clear idea of the great shrine of a great Mediæval Church; and lastly, because Mr. Lloyd has grievously disappointed us.

There can be no question that the rapid development of archæological science during the past quarter of a century has done much service in the cause of truth; that historical error has retreated before the advance of this science, and that the merely legendary is on all sides being driven by it within its proper boundaries. But in the midst of this progress we are every now and then reminded of attendant drawbacks. We can hardly go twenty miles from Temple Bar without meeting with some instance of ill-directed archæological zeal, and nowhere is there to be found greater proof of the widespread character of this zeal than in that rampant ruin which, under the fashionable name "restoration," has devoured so many hundreds of our old churches. Another evil that accompanies the progress of this science, and the multiplication of archæological societies, is the excuse that it offers to every member to rush into print on the slightest provocation. And of this evil, we are sorry to say the case before us is an example. Out of twenty pages, four only are devoted to the "architectural account" of the shrine basements of S. Alban and S. Amphibalus. Of these two most remarkable and rare examples of the mason's craft, possessing many points of peculiar interest in an architectural as well as archæological point of view, we are told their dimensions in the roughest manner, no point or level of measurement being indicated, except in the steps. We are further told that each pedestal is composed of a "solid basement," a series of canopied niches, and a cornice; that in one (S. Alban) the *solid basement* is "pierced with a lozenge-shaped opening, 10in. in diameter" (a measurement which suggests the question, What is the diameter of a lozenge?); that the roofs of the niches are of clunch, "carved with reticulated tracery," a very fine phrase, but unfortunately inaccurate, seeing that the *roofs* are carved out in groins, with very delicate ribs; we are told also the subjects of the sculpture, and that there were six twisted shafts, "which probably supported tapers." Of the difference to be observed between one portion of the sculpture and another; of the archaic, stiff, angular character of the figures in the martyrdom, the free, we might add, noble style of the seated figures; of the wonderful minuteness of the detail of the marked contrast between the pedestal of St. Alban and that of St. Amphibalus—which last is supposed to be half a century later than its companion—not a word is said, nor is any idea given of the elaboration of the work by reference to the different planes of tracery, cusp, moulding, &c., whilst in a work of such delicacy inaccuracy of the measurement of details is just one of those things which might very well have been omitted. If our readers will take the trouble to refer to pp. 100 and 101 of Professor Willis's "Architectural History of Canterbury Cathedral"—a book that every archæologist ought to possess—they will learn in a very few words the broad characteristics of a great English shrine. It was generally composed of four distinct and separate parts, developed from two—*i.e.*, the altar and the tomb. The body of the Saint at first reposes in a stone cist or coffin, across the west end or head of which stands the Saint's altar. As time advances, and the Saint becomes known, and pilgrimages to his burial place grow popular, the body is removed into a chest (feretory), and in the place of the old tomb a small structure is raised to serve as a pedestal for the chest, so that the people may more readily see the object of their veneration; for the chest or feretory, however disguised in shape or gorgeous in material, is nothing more than the coffin of the Saint, generally, however, enclosing a shell, a second coffin. In course of time offerings of precious stones and works of art are made, and these are encrusted on the coffin chest or feretory, until at last the whole chest is one mass of shining gold and jewels, which it now becomes necessary to protect by a cover, in all probability usually made of wainscot decorated with paintings raised and lowered by means of ropes and pulleys. The whole shrine stands then in its highest state of development, when it consists of (1) the altar (which our youngest readers must not confound with the high altar); (2) the pedestal; (3) the feretory, and (4) the cover. Now, properly to understand this shrine of S. Alban there are four things to be done: (1) To examine the existing remains; (2) to compare them with other existing remains; (3) to examine contemporary records, illuminations, &c., and (4) to compare them with the records of other shrines. Had this been done we can hardly suppose that the three pillars in advance of the shrine on each side of it would have been put down by the Hon. Sec. of an Archæological Society as so many candelabra.

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The foundation stone of a new parish church was laid at Jedburgh on Friday last. The style will be Early English, and the building will accommodate 1,000 persons.

It is not true, as has been stated, that Canterbury Cathedral is without an architect. The architect to the Dean and Chapter is Mr. H. G. Austin, F.R.I.B.A.

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* "An Architectural and Historical Account of the Shrines of S. Alban and S. Amphibalus in S. Alban's Abbey. By RIDGWAY LLOYD, M.R.C.S., one of the Honorary Secretaries of the S. Alban's Architectural and Archæological Society.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, the President, Mr. T. H. Wyatt, in the chair, after the usual preliminary business had been disposed of, Mr. Henry Cole. C.B., Director of the South Kensington Museum, was elected an Hon. Member, and M. Charles Questel, of Paris, Member of the Institute of France, was elected, by acclamation, an Hon. and Corresponding Member. The following gentlemen were also balloted for and duly elected:—As Associates: Messrs. H. A. Freeman, of Upper Tooting; W. V. Gough, of Bristol; A. Hawksley, of Staples Inn; W. Owen, of Warrington; and J. B. Wilson, of Bath. As Contributing Visitor: Mr. A. D. Dawnay, of Walbrook.

Mr. SEDDON directed the attention of the meeting to the position of the Architectural Art Classes. A short time back he had received from Mr. T. H. Watson, the Hon. Sec. of the Classes, a letter asking him, as delegate of the Institute to the Classes, to subscribe towards the funds, which were about £80 in arrear. He (Mr. Seddon) had accordingly written to the Council of the Institute upon the subject, and in reply had received a copy of a letter which had been sent to Mr. Watson to the effect that in the opinion of the Council the results of the Classes were not of such a nature as to justify any further grant from the Institute funds, even supposing the Institute had funds for the purpose, which at present they had not. He wished to ask the Council to further consider the matter, and would be glad to learn whether the Institute (which had liberally subscribed £50 a year for two years to the Classes) considered that the continuance of the Art Classes was desirable or not. He believed that the Classes were doing a great deal of good, although, perhaps, they might require revision or improvement.

The PRESIDENT said he could not then enter into the question which Mr. Seddon had raised, inasmuch as the Council had instructed the delegates of the Institute to prepare a report upon the subject, and the Council could not come to a decision until it had the delegates' report before it. The Council had that evening resolved, however, that in the event of the classes being brought to a close the Institute would consider whether it should contribute towards the deficiency of £80; and also that if there was any prospect of continuing the classes with success, the question of the capitation grant should be taken into consideration. The finances of the Institute were not in such a condition as to justify much liberality, and it should be borne in mind that when the classes were started it was distinctly laid down that the grant from the Institute was not to be regarded as an annual one.

After some further remarks on the subject by Mr. Phené Spiers and Mr. Eastlake, the Secretary,

Mr. C. H. HEATHCOTE, Associate, read a long and very interesting paper (of which we append a brief abstract).

ON THE OLD HALLS IN THE NEIGHBOURHOOD OF MANCHESTER.

The author remarked that these halls had not been sketched and written upon to any extent. Although South Lancashire could not compete with any other district in the matter of ecclesiastical architecture, yet it could hold its own in samples of ancient domestic art. Within a radius of a few miles of Manchester such structures abounded. At *Stockport*, five miles from Manchester, until the time of Henry II., a castle stood on the site of the present market hall. Under one side of this abrupt elevation was a street following the line of the old Roman road, and containing a picturesque old half-timbered house, now used as the bank. With the exception of the principal front and what was now the bank-room, the building was modern. *Arden* (or Harden) Hall, two miles from Stockport, was a fine example of the domestic architecture of the sixteenth century. Half of the moat was perfect even now, being full of water. Man, far more than Time, had caused the ruin of this house. Beams had been ruthlessly torn away, and the woodwork taken by the farmers for their own use. The ground plan neither resembled a T nor an H, as differently described by the local historians. The main entrance door was at the side, and not, as was usually the case, in the front of the tower, and was approached by a broad flight of four or five steps. The tower made an ante-room or vestibule to the large hall. Exactly opposite the doorway leading into the hall from the ante-room was a similar doorway into the staircase tower. This winding staircase was built entirely, including the central newel post, of oak, put together with oak pins—a form of joinery we should do well to imitate now-a-days, especially for outdoor work. There had evidently been basement, ground, first, and second floors. On the ground floor was the great hall, 33ft. long (in addition to the raised platform at one end, of another 11ft. or so) and 24ft. wide, but yet so low as to necessitate windows at both ends and both sides. The height could not have been more than 12ft. in the clear. The ceiling was divided into bays by large moulded oak beams, between which the joists (13in. by 3½in. oak, and double-joggled 4½in. into the beams at each end) ran, leaving the underside of the first-floor planks discernible. Part of this hall now served as the dairy for one of the farm-houses, built a little later than the hall, and standing within the moat. The woodwork of all these half-timbered houses was put together with oaken pins, and it was doubtless mainly owing to this that so many of the exteriors were still in such good preservation. The lantern of the tower was in tooled stone, whilst the remainder of the walls was built in parpoints. About three miles from Arden was a half-timbered chapel-of-ease at *Denton*, with a lych-gate of the same period. The old timbers of the chapel had been boarded over, and the boards painted in imitation of the woodwork construction beneath. A new chancel, &c., have been recently added. To the east of Stockport was *Marple* Hall, another most interesting specimen of domestic architecture. The principal front was within a square court, and was originally finished with gables, bay windows, and a tower over the entrance. The latter opened to a low hall and an ancient heavy staircase, leading to numerous small apartments. But the extensive stables and offices were the attraction, and were certainly the more picturesque. They were built of red sandstone, having quaint gables, and a tower (containing a peculiar old clock) finished with stepped gables. These stables were now deserted. By passing over the knoll in front, a splendid view was gained of *Oakwood* Hall, situated on the summit of a hill rising abruptly from the river Goyt. The site was grand, and the hall, when viewed from a distance, showed a mass of building well befitting such a position, but on closer inspection, all ideas of architecture were found to have been thrown to the winds, leaving nothing but that which was debased. *Bramall*-Hall was situated about three miles south-west of Stockport, and when approached from that direction presented an unusually striking appearance, exhibiting a long line of picturesque irregularity. This was certainly the finest and most perfect example of a *bona-fide* half-timbered house near Manchester. The building was originally quadrangular in plan, but the western side of the quadrangle was removed some time since. A porch admitted from the court-yard into the great hall, now called the large dining-room. This hall, 36ft. square, was a fine room, with its bay window, old fireplace, and massive timbers. The whole of the furniture was of the same period as the hall. At one end was formerly a passage through the building, as in college halls, communicating from the courtyard to the front entrance. The small room now used as the library, besides being wainscotted, had a fine timbered ceiling, with wooden pendants at the intersections of the moulded ribs. The laundry (now the billiard-room) and the chapel had heavily-timbered ceilings. The doors of the billiard-room deserved attention, being 3½in. thick, and having handsomely carved middle and bottom rails. The old benches still remained in the chapel, and exhibited some curious carving. A spiral staircase composed of solid blocks of wood led through an ante-room and the "plaster-room" to the drawing-room, a magnificent apartment, standing over, and being of the same size and plan as the great hall. This room was wainscotted nearly to the ceiling, only leaving space for an ornamental plaster cornice. The ceiling was of plaster, divided into panels by richly-moulded ribs, and highly ornamented with pendants. The mantel-piece was of wood, but had been painted white. The other woodwork—the mullions of the windows, the oaken floor, the wainscotting, the doors with their inlaid pilasters, and the fine old furniture—was intact and perfect. The old leadwork, worked in designs of the circle and quatrefoil, was untouched also. The "plaster-room," so called from the materials of which the floor and ceiling were composed, was at present a "young museum." It was lit at one end by a fourteen light window, and had a richly-moulded massive tie-beam of the roof showing in the ceiling. The iron stay-bars to the windows were placed *inside*, not outside, and, in consequence, had been little affected by atmospheric influences. The staircase corresponding to the spiral one on the opposite side of the building was still formed of solid oak steps, but was square, with quarter-spaces, and supported on four stout newels, at the angles of which were placed wooden handles in lieu of handrails. The banquetting hall, according to Ormerod, was about 42ft. by 21ft., the floor being of plaster, and the sides of timber and plaster, painted with figures and foliage in imitation of tapestry. The roof was divided lengthwise into six compartments, supported by massive arched timbers, the alternate ones being supported by uprights resting on obtuse arches of oak, sprung from pilasters. The sides of these arches were ornamented with foliage, rosettes, and quatrefoils, and finished at the top with an embattled moulding. There had been originally three windows in each side divided by upright mullions only, with highly carved Gothic heads. There was formerly a gallery running round the greater portion of the building, which was only taken down to prevent its falling of its own accord, and perhaps taking a goodly portion of the hall with it. An old gallery similar to this still existed at Moreton Hall, near Congleton. The date of Bramall was about 1592. There were several half-timbered houses in the neighbourhood having connection with the hall in some way or another. *Withenshawe* Hall was a half-timbered structure which had been much altered at various periods, and had received many additions and improvements from the late proprietor. A fair proportion of the original building was still preserved. Half a mile from Withenshawe is *Baguley* Hall, or what *was* Baguley Hall, for it is now nothing more than a farmhouse. The original building evidently consisted of a central hall, with two wings divided into apartments, and the porch, with a room over. All that remained of the former structure were two bays of the old hall, with the original half-timbered end, and the porch. The great hall, when perfect, consisted of three bays and an extra length of 6ft. near the doors, the central bay being larger than the other two, and containing a four-light instead of a three-light window. It was 28ft. wide, and had an open roof, framed together out of massive oak, richly moulded. The extra length of 6ft., near the doors, was partitioned off some 4ft. or 5ft. from either wall by an oak screen of ornamental construction, rising from the ground and carried up to the roof principal, to prevent the draught from the doors annoying the occupants of the hall. The wings of the old half-timbered building and the other bay of the great hall, where the raised platform once stood, at one time showed signs of giving way, and had to be replaced by the then owners, who, less artistic than their ancestors, used bricks in lieu of oak. The porch retained the lancet-headed door, with the wooden label mould to the doorway. The great hall now served merely as a playground for children. This building dated from about 1590. *Lyme* Hall was a large and extensive building, built of dark stone, and presenting, with the exception of the eastern side, plain and almost unbroken fronts. The northern front had its general plainness relieved only by an ornamental entrance in a very mixed style of architecture indeed, and by two slightly projecting wings. The fronts to the east and west were likewise plain in character, but the eastern front was broken by numerous projections. The principal front faced the south, and it seemed as though the other sides had been rendered as plain as they could be in order to allow as much ornamentation (?) here as the means at the disposal of the architect would permit. This front had in the centre a large Ionic portico. On the south side of this building was an apartment wainscotted to the ceiling, and containing some exquisite carvings by Grinling Gibbons. *Reddish* Hall, taken down in 1780, was a fine half-timbered house, with an elaborate front; the panels formed by the upright and cross pieces of timber being filled in with quatrefoil patterns. It was probably built about the same time as Bramall Hall, with which it was in close proximity. *Handforth*, a village some four miles from Stockport, contained another example of the sixteenth century hall in the half-timbered style, but of an entirely different mode of construction to those which had been referred to.

Methods of Half-Timbered Construction.—Of the class of structure previously described, there were several methods of timber construction in use, of each of which we had, more or less, many good and perfect examples remaining. The simplest form was that of mere uprights, sustained by cross-pieces or ties, halved to let into the uprights in such a manner as always to show the straight line of the upright, and securely fastened to same with stout oak pins. The panels thus formed were filled in with brick, which was sometimes plastered or stuccoed. The gables of this primary period were filled in between the tie-beam and main rafters (which were always visible flush with the exterior line of the wall) with struts, footed on the tie-beam, and running at right angles to the principal rafters, thus giving, as all true art should, the *real* appearance, and not the *sham*, of support and strength to the purlin ends and roof, in addition to the ornamentation of the building. As this style of building advanced, the panels in the walls were filled in with diagonal pieces, alternating from left to right, and right to left, in a sort of imitation of the strutting in the gable ends. And this was not a mere filling-in for the sake of appearance only, for it gave great extra strength and bond to the whole structure. Still later, the uprights and cross-pieces were so cut as to form quatrefoil and trefoil panels. When this was first done the forms of the quatrefoil, trefoil, or what not, were actually cut out from the solid uprights and other pieces, and it was only at a somewhat later period that the wood forming the outline of the panel was made by itself and let into the uprights and tho other constructional timbers. Some idea might thus be formed of the immense timbers used in the construction of these houses, and used not only to serve one purpose, but many. At Baguley, for instance, the oak upright against which the heavy principal of the roof butted, and into which the gutter-bearers, window-heads, sills, and all the constructional cross-pieces were tenoned, was richly moulded on the inside, moulded on the sides to form the window jambs, and on the exterior (for, although it projected some 9in. into the hall it penetrated through the wall) was cut into to form the quatrefoil panels with which the outside was ornamented! To go still later with this history, there were upper portions of buildings corbelled out, to project beyond the lower, and many other such like methods of carrying as far as possible, but in strict accordance with ideas of picturesque architecture, this style of wooden construction. But it was carried to excess. It was thus that we had huge square projections, with heavily-timbered and plastered sides, awkwardly and uncomfortably resting on or over-reaching octagonal bay windows, with delicately moulded uprights, and presenting anything but a safe construction or good outline. The decay of this special phase of art commenced about the year 1605, the general ignorance and total absence of all art feeling or love of anything even distantly approaching to architecture culminating in the men who could deliberately fasten laths to the old timbers, and plaster them up from the light of day. But besides these several different methods of construction there was the mode of making merely an outer framework of wood, formed of much stouter timbers than those used in the before-mentioned periods, and filling the entire space between (except that required for windows) with brickwork, thus doing away with all stays and intermediate cross pieces. This brickwork was coloured, and wooden braces, stays, panelling, &c., imitated on it by means of paint. The exterior imitation in paint of woodwork construction in these houses was no proof of their being built at a late period, or at an age of debased domestic architecture.

Handforth Hall was in capital preservation, and was a fair and good specimen of its class. The front was broken up by two projections, finished with beautifully-proportioned gables. The main block of the structure was roofed in one good span. The ground plans of all these sixteenth century minor halls showed a marked resemblance. In by far the greater number there was one great hall, extending nearly the whole length of the building, and completely across the main portion. On either side, and sometimes at both ends, small projections occurred, and in the centre another, generally made into a kind of tower, containing the main entrance and porch. Handforth possessed such, the uprights (which were of oak, and 16in. by 12in. scantling) on each side of the porch being carved and moulded similarly to the lintels. It was worthy of note that invariably, in half-timbered houses of any pretensions, the woodwork never commenced nearer than a foot to the ground, and was laid on a stone foundation. Within the boundaries of the City of Manchester there were once many good examples of the houses of the nobility, showing impress of the sixteenth century. But one by one they have been obliged to make way for the march of commerce and of trade. The oldest houses here possessed had been taken down within the last few weeks to afford a site for a new warehouse. *Trafford* Hall contained no special feature of interest. On the opposite side of the river Irwell was *Ordsall*, a hall that at one time must have been as picturesque a half-timbered house, from certain points, as any in the neighbourhood. But it had first been spoiled, and then left to decay. The date of the building was 1609, or thereabouts; one wing, however, bore record of having been erected in 1639. The whole of the fronts had been carefully covered over with lath and plaster, the ornamental timbers serving as studds to which to nail the laths. Only one portion of the building was at present occupied, the other being deemed unsafe. The staircase presented the most perfect detail, containing two splendidly-carved and proportioned newels, with turned balusters to match. The house could also boast some quaint bay windows, and a very fine open-roofed chapel, with richly-moulded hollow wooden piers. Within half-a-mile of Ordsall, but on the opposite bank of the stream, there once stood an old building known as *Hulme* Hall, which was taken down about fourteen years ago. *Ancoats* Hall, at present a brick edifice, affording a most perfect picture of desolation, neglect, and misery, was once "a very fine building of wood and plaster." It was a pity it had not remained so, for the sooner the existing place was pulled down and the land disposed of the better. There were many other old houses and halls still existing in the suburbs and townships of Manchester, but most of them had been so altered to suit the requirements of the different ages through which they had passed, and the tastes of their owners, that the main points of interest generally expected were looked for in vain. Of those that still afforded repayment for the trouble of research were several half-timbered houses in the *locale* of the Cathedral, one of which was specially noticeable, having a tower in the main front springing from between two gables; and in Poolfold there was an old house. But the most interesting work of any antiquity, after the Cathedral, was a building situated near the centre of the city, and known as *Chetham's Library and Hospital.* It occupied one side of a large court or quadrangle, and was situated on a rock overhanging the river Irk. The college had at divers times undergone various alterations, but still presented such marks of antiquity and exhibited such characteristics of the architecture of collegiate halls of the age of Edward VI. as to make it of great interest. The three other sides of the court were taken up respectively by the Grammar School, business houses, and a roadway dividing the quadrangle from the Cathedral yard. In his concluding remarks, Mr. Heathcote said that Manchester and the whole of the vicinity could not show a single specimen of architecture earlier than the Perpendicular period. This clearly was the reason for the field being so seldom taken up by architectural students, except by a few residential ones, for information and research, Lincolnshire, Warwickshire, and the Midland counties being chosen rather than Lancashire. As far as related to ecclesiastical architecture, the wisdom of their course could not be doubted, but in regard to such domestic art as could be so well, if not better than any other, adapted to the requirements of the present age, he recommended the study of the houses of the sixteenth and early part of the seventeenth centuries, of which Cheshire and South Lancashire afforded so plentiful a supply, and not only plentiful, but good.

DISCUSSION.

Mr. Hadfield said he was glad to bear testimony to the interesting character of the paper which had been read. Personally, he had taken a good deal of interest in these old halls and buildings, and he thought they would well repay a visit, as they offered a field for hard, earnest study. Buildings of the kind described, especially on the borders of Yorkshire and Derbyshire, were particularly worthy of attention, and many valuable hints in domestic architecture might be derived from them.

Mr. Waterhouse having proposed a vote of thanks to Mr. Heathcote for his paper,

The President said that there was one drawback, viz., the absence of plans, which would have been very useful in elucidating the paper; but he hoped that at some future time they might have an opportunity of seeing the plans.

Mr. Seddon also hoped to see the plans with which he understood that Mr. Heathcote intended to supplement his paper. He did not know much himself about these old timbered halls, but believed that the whole country was full of works of that kind. They abounded particularly in Yorkshire, and possessed many charming details. New Hall, near Halifax, had some charming rose windows, which were exceedingly bold and effective, over the porch.

Mr. Wyatt Papworth, in seconding the vote of thanks to Mr. Heathcote, said it would be interesting to know who were the authors of these quaint buildings. Possibly Mr. Heathcote possessed some information upon the subject. It sometimes happened that the name of the designer was written over the porch, or in some other prominent part of the building.

Mr. Phene Spiers suggested that a map should be prepared for the guidance of students who might visit the halls.

The proposition was carried by acclamation, and the proceedings terminated with the announcement that the next meeting of the Association would be on January 6, 1873, when Mr. Banister Fletcher will read a paper on "Arbitrations."

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting on Friday evening last, the President, Mr. J. Douglass Mathews in the chair, the following gentlemen were elected members of the Association; Messrs. F. A. Butler, B. Budd, — Hardcastle, J. M. Gibbs, Reed, M. Wale, and E. C. Lee.

The President then described at some length certain modifications which had been made in the working of the Association's classes, &c., in order to enable country members to participate more largely in the benefits afforded by the Association. The Elementary Class of Design, and the Classes of Design and Construction would, by the new arrangements, be made to do their work under the cognisance of country members, who would inspect the designs and drawings submitted, in the classes, read the criticisms thereon, and make such criticisms of their own as they thought fit. The benefits of the library—the only circulating architectural library in the country—would be also extended to country members. The arrangements made were experimental and tentative, and subject to such further modification as might be found desirable.

It was announced by Mr. Sulman that a class was being formed for the study of Colour Decoration.

Mr. Charles Baily, F.S.A., of the City Architect's Office, Guildhall, then lectured

On History Illustrated by Stained Glass, with Especial Reference to the Windows of Long Melford Church.

Mr. Baily commenced by stating that as he had suffered very much in health of late he had been unable to write a paper on the subject, and he therefore claimed the indulgence of his audience while he attempted to speak the few remarks he had to make. He had given some years of study to the glass of Long Melford Church. Perhaps he ought to make some apology for bringing such a subject before the Association, as it was not strictly of an architectural character, but the subject was closely allied to architecture, and was one of very great interest. With regard to the churches generally of the Eastern Counties, all who had seen and examined them must at once have observed that there was something in them beyond a mere English character. Indeed, there was a certain amount of foreign character in nearly all of them that were of anything like a date subsequent to the fourteenth century. Long Melford Church was one of those extraordinary specimens of Early Perpendicular architecture which were raised chiefly by private means. King Edward III. having formed an alliance with Philip of Hainault, invited to this country a number of foreigners, who were chiefly engaged in the manufacture and sale of cloth. These foreigners were principally Flemings, who by their industry and perseverance soon became rich and large possessors of the soil, and married into old English families. The Church of the Holy Trinity, at Long Melford, was a very remarkable specimen of Perpendicular architecture. The history of the rebuilding of that church was told very concisely in certain inscriptions on different parts of the building, in which the names of several members of the Clopton family, which was the great family of the neighbourhood (and nearly always the name of John Clopton), were conspicuous. John Clopton was the representative of a very old English family, probably Saxon in its origin, and he seemed to have governed the whole of the neighbourhood. From the inhabitants, who were chiefly of Flemish origin, he collected goods and money for the rebuilding of the Church, and not only for the Church of Long Melford, but for the Church of Lavenham, close by, and the Church of Glemsford, and others, which all bore evidence of one master-mind having superintended their construction. But when John Clopton rebuilt Long Melford Church he did something more—he filled the windows with stained and painted glass. There were ninety-nine large windows in the church, and these were all filled with stained glass—no small work. The glass was of two different kinds. There were remains of figures of saints and some pictures of sacred and early ecclesiastical history, but the most interesting figures were portraits of men and women who lived at the time—just upon the close of the Wars of the Roses—and all, moreover, were portraits of men and women who played a very important part in history, and whose deeds were written in the annals of the country. John Clopton himself was a zealous Lancastrian, and in choosing portraits for the windows of his church, he chose them from his own family and from those families with whom he himself had any connection whatever, either by blood or by marriage, or in political sentiment. He was connected with a large number of the great families of England. At the end of the reign of Edward III. one of his ancestors enhanced his fortunes by marrying a rich heiress of the neighbourhood, one Catherine Lisle, who, after the death of Sir Thomas Clopton, her husband, married Sir William Tendring, of Tendring Hall, Stoke-by-Nayland, by whom she had a daughter, who became the wife of Sir Robert Howard, the grandfather of John Howard, the first Duke of Norfolk of that family (and the "Jockey of Norfolk" of Shakspeare), who was killed at Bosworth Field. This showed how it was that so many members of the Howard family were represented in the window. In one window there was a representation of Lord Chief Justice William Howard, who lived in the reign of Edward I., and who was the founder of the Howard family. Then there was a figure of Lady Elizabeth Howard, who was the wife of John, twelfth Earl of Oxford. This Earl of Oxford, whom Sir Walter Scott had introduced into his tale of Anne of Geierstein under the name of Phillipson, was a very powerful Lancastrian and a great partisan of Henry VI., and he was, with sixteen others (of whom John Clopton was one), committed to the Tower in the reign of Edward IV., and he (with all but John Clopton) lost his head. John Clopton escaped. Of the Howards there were also two female figures, one — Lady Elizabeth Tilney— being a Howard by marriage, and wife of Thomas, second Duke of Norfolk, the hero of Flodden Field. The lady whose portrait was represented with hers was the wife of John Mowbray, the last Duke of Norfolk of the Mowbray family, and daughter of John the great Earl of Shrewsbury, who played so much havoc in France during the wars of Charles VI. There was also the figure of another female Howard—Lady Howard of March, but Mr. Baily could not tell what her maiden name was, because, unfortunately, there was no coat of arms to help him. While speaking of coats of arms, he would draw attention to the great peculiarity of the dresses of these figures, particularly those of the females. On the outer cloaks of. the females there were coats of arms; these were the arms of the husbands. The arms upon the kirtles or gowns were the arms of the ladies' own families. It was a matter of some astonishment, although of great gratification, to find that so much of this glass remained to this day in a tolerably perfect condition, for the neighbourhood was the very spot where that terrible fellow Will Dowson was so hard at work, and where he had such positive instructions to destroy everything in the shape of a "superstitious picture." There existed in the church books accounts of payments made for destroying some of these glass pictures. The glass which remained was highly valuable, rude as it was in drawing, as throwing a light upon the costume of the times. Among the figures were those of two Lord Mayors of London—Lord Mayor Josselyn, who was twice Lord Mayor, and Lord Mayor Gedney, both of whom were connected by marriage with the Cloptons. The windows also contained the figures of three judges. One of them, Judge Hough, was described as John Hough, Justice-of-the-Law; and there was Richard Pigott, also Justice-of-the-Law. Judge Hough, it appeared, was only a judge-itinerary, and he was represented in the window as a serjeant-at-law, his dress being particularly interesting as illustrating Chaucer's lines describing the serjeant-at-law in his motley or parti-coloured dress. Judge Richard Pigott was dressed in the same manner. The figures of these two judges afforded an illustration of the "trading" way in which stained-glass windows were made even in the Middle Ages. The figures of Hough and Pigott faced each other. When Mr. Baily had drawn the figure of Hough he began to draw the figure of Pigott, and it seemed very much like drawing the same thing over again. He soon discovered that by turning over the cartoon of the one figure it exactly fitted the other figure. The features were different in the two figures, but there was scarcely a difference in the lines of the figure or in the leading, except that the cartoon for one figure had been reversed to do service for the other figure. The red colouring of the gowns was only slightly different. The figures of these judges were interesting as showing the old form of the coif—the little black patch carried on the top of the wig of a judge. The faces of the persons who were living at the time the windows were executed were, Mr. Baily was persuaded, meant for actual representations of the men as they lived, and the faces were without doubt intended to serve as portraits. On the other hand, in the figures of persons who were deceased at the time the windows were executed the faces were very tame and without any individuality. Among the figures was one of Lady Hogard, daughter of Sir Andrew Hogard, chamberlain to John, Duke of Bedford, who became the second wife of Sir Robert Crane, Sir Robert's first wife being a daughter of Sir Robert D'Arcy, and sister to the wife of John Clopton. Another figure represented the daughter of Lord Henry Percy, who was killed at the Battle of S. Albans. Another, and a very curious figure, was that of Lady Margaret Leynam, curious as bearing on her cloak an instance of false or bad heraldry. The field being gold, the chevron and the bears' heads were yellow, or gold—*i.e.*, metal upon metal, which was bad heraldry; it should be metal upon colour, or colour upon metal. There seemed to be some reason for this, however. The most learned of the county antiquaries could not find out who Sir John Leynam was. The probability was that he was originally called John of Lavenham, but that after he had made money by trading he married into an old family, took some sort of a coat of arms, and contracted his name to John Leynam. His wife was a daughter of Sir John Fray, Baron of the Exchequer, and in the figure she bore on her kirtle her own coat of arms. The ecclesiastical glass of Long Melford was of very great interest. It included a very curious though a somewhat disagreeable picture of Our Lady of Pity with the dead Christ in her arms—or, as the Italians would call it, a *pieta.* The figure of the dead Saviour was very emaciated, and covered all over with drops of blood, and, curiously enough, each of these drops of blood was a trinity, there being three and one. This figure was also curious as showing the mistakes into which the glass painters of the Middle Ages, as well as those of the present day, were apt to fall through carelessness. He did not for a moment uphold as works of high art any of the windows in Long Melford Church; on the contrary, they were rather low in the scale than otherwise, even for glass painting; but still the glass painter had been very careful, in a truly Gothic manner, to ornament the prints of the nails in the feet and the wound in the side of the Saviour, but he had entirely forgotten to represent the wounds in the hands. Another figure in the east window of the church was that of S. Edmund the King and Martyr, King of the East Angles, probably a favourite saint in the neighbourhood, having been interred at Bury S. Edmund's. The two latter figures were represented as standing on altars, and in front of each altar was a figure praying. It was somewhat curious that in direct contradiction to the canons of the Romish Church, these altars were represented as being of wood, the Romish Church ordering all altars to be of stone. There could be no mistake about this, as the grain of the oak was shown, and the legs which supported the tables or altars. The figure at the feet of S. Edmund represented the last Abbot of Bury, and there was a tradition in the neighbourhood that the other figure represented one of the D'Arcy family, which John Clopton married into. Another figure contained in the windows was that of Sir Edmund Montgomery, who was a great man in his day, and a prominent Lancastrian; but, like many more, when the tide turned in favour of the Yorkists he joined Edward IV. He was entrusted to take in charge Margaret of Anjou when she left England for ever, and Edward IV. had such confidence in him that he made him the executor of his last will. Besides the *pieta* and the S. Edmund, there were other ecclesiastical figures, notably two, which were rarely or never found in England. The first was that of S. Dominic, the founder of the great order of mendicant friars, and the second was that of his successor and apostle, Peter Martyr. These figures were particularly interesting from the lower parts of the subjects, which represented figures praying to the saints, the figures being within regular open-ended church benches, with panelled fronts, thick bench-ends, and poppy-heads. Mr. Baily concluded by pointing out in detail the peculiarities of the figures as shown by the very excellent and large series of cartoons with which his remarks were illustrated, and by a brief reference to some ancient stained glass at Salisbury and elsewhere.

Mr. Boyes, Librarian, proposed a vote of thanks to Mr. Baily for his lecture.

Mr. T. H. Watson seconded the motion, remarking that he saw no reason why the plan which had been adverted to of reversing the cartoon of one figure to make it serve for another figure should not become more universal. Mr. Day, in a paper read some time ago before the Association, had advocated the production, with due precautions, of replica works in stained glass in this manner.

Mr. Sulman said that Mr. Seddon had recently put forward the theory that where, as in the Long Melford windows, the figures were represented as praying with their hands apart, it implied that the persons represented were living at the time the work was executed, and that, where the hands were closed, the persons represented were dead before the work was executed. He thought, however, that Mr. Baily's explanation that the Flemings and Walloons always prayed with their hands apart was the correct one, especially when the history of that part of England and its contiguity to the Low Countries were considered.

Mr. Clarkson having made a few remarks, the vote of thanks was put to the meeting by the Chairman, and unanimously carried.

Mr. Baily, in reply to a remark by one speaker, said that the era of the Reformation must not be credited with too large a share in the destruction of so much that was fine in architecture and art. A great deal of stained glass had perished through the neglect and petty pilfering of subsequent ages, and a great deal had been destroyed under cover of the cant term "restoration." (Hear, hear.) In its architectural sense, the word "restoration" ought to be expunged from the English dictionary (cheers), and one very much like "destruction" or "defacement" substituted for it. (Hear, hear.) As to whether he had any facile knack of making such cartoons as those exhibited, he knew of no way of producing them but by the old methods.

The meeting then terminated.

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ARCHITECTURAL SOCIETY OF THE ARCHDEACONRY OF NORTHAMPTON.

THE annual meeting of this society, for the election of officers, and for other business, was held at the society's room on Monday week, the Rev. Lord Alwyne Compton in the chair. The former officers were re-elected, and five new members were added to the committee. The report of the committee for the past year was read and adopted. The treasurer's report for the year ending September 30th was read as follows:—Receipts: Cash balance, Sept. 30, 1871, £130 7s. 11d.; subscriptions and arrears, £68 1s.; interest on deposit amount, £4 10s.; total, £203 8d. 11d; deduct payments, £78 5s. 8d.; leaving £125 3s. 3d. Deposit account, £150. Payments: Secretary and treasurer—Postage £3 5s. 2d.; printing, £1 13s.; librarian, rent of society's room, insurance, attendance, and postage of reports, £14 14s. 6d.; Williamson, for share of associated volume, £38 12s. 10d.; Birdsall, bookbinding, &c., £6 18s.; books purchased, £3 11s.; photographs purchased, £2 1s. 2d.; photographs of S. John's Hospital, £4 10s.; subscriptions to architectural sketch-book, two years, £3; total, £78 5s. 8d.

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BOOKS RECEIVED.

Our Work in Palestine, by the Committee of the Palestine Exploration Fund (London: Bentley & Son), is an account of the different expeditions sent out to the Holy Land, and the work accomplished by them. Those who have followed the work of the Society will not find much that is new in the book, and possibly a single author instead of "the Committee" might have thought fit to have added a word or two of title or explanation to the illustrations which appear in the work, in many cases apparently only to fill up space.—*Coal and Coal Mining*, by Warington W. Smyth, M.A., F.R.S. (London: Lockwood), is a second edition, revised and corrected by the author. The progress made since the first issue of the book, in 1866, by engineers in coal-getting, underground haulage, and ventilation of the works, is taken note of, and a chapter devoted to the consideration of the question of the probable duration of our coalfields.—*The British Almanac and Companion*, for 1873 (published by the Stationers' Company, London), gives, for the forty-sixth time, its useful budget of information. We are glad to find the sources of the list of new buildings honestly acknowledged.—*A Treatise on Waterworks for the Supply of Cities and Towns*, by Samuel Hughes, F.G.S. (London: Lockwood), is a new edition, revised by the author, with a preface by Mr. Arthur Silverthorne, C.E. The book has always enjoyed a recognised position as a valuable work of reference, and the present enlarged edition borrows a new interest from the fact that its revision was one of the last acts of its author's life.—*Ross's Wages Calculator* (Edinburgh: Ross & Co.) gives the rate payable for every quarter of an hour from one to sixty hours, at rates from ¼d. to 1s. per hour.—*Free-hand Drawing Test Papers and Class Sheets for Practical Geometry*, by John S. Rawle (London: Simpkin & Marshall), are a well-devised means of assisting the teacher of a large class by supplying the students with exactly similar examples with printed instructions. The student draws his copy on these sheets side by side with the example, and thus a large class can be easily instructed. The class sheets are for use with the author's *Practical Plane Geometry*, a capital text-book, but somewhat disfigured by some typographical eccentricities.

S. JAMES' CHURCH, GREAT YARMOUTH.

John P. Seddon, Architect.

S. JAMES' CHURCH will be the new district church, at the extreme south end of the town of Great Yarmouth; the noble old parish church of S. Nicholas being at the extreme north end. In more than one respect the new church is designed to rival in point of scale its predecessor; thus in width across it is almost its equal, and in height somewhat superior; but in length it falls far short. Yet this deficiency will not at first sight be apparent from the exterior point of view, as the position intended for the tower is such as to make it appear like the eastern portion of a still larger fabric, which may be supposed to extend westward of the projection of the tower.

The site given was difficult to treat, being almost square, the plan consequently adopted is that of a vast Greek cross, formed by the nave, chancel, and transept, each 33ft. clear, internal width. The rectangular form is completed by aisles parallel to the nave and chancel, the tower and spire standing out in projections at the north-west angle. The view seen in our illustration is from the road approaching the church, and, practically, is almost the only one which can be obtained of the building as a whole. In some of the features. such as planting a lofty pinnacle at each angle of the building, the precedent of S. Nicholas Church has been followed. This was not only with the view of preserving and emphasizing, as it were, a local type, but also to afford abutments for the arrangement of wide arches within, which is the peculiar feature of the church. The whole area is covered in with but four internal supporting columns, the arches springing from which are unusually wide, so that there will be scarcely any interruption to sight or sound internally. The chancel alone has been built, as yet, with its arches restrained by iron ties, and filled up temporarily with brickwork. The accommodation will be for about 1,200 persons on the ground floor, at the cost of about £10,000. The material of the walling is flintwork, with brick bands and quoins, and stone dressings, with Memel roofs, covered with green slating, and ceiled within with curved boarded ceilings, with moulded intersecting ribs, cornices, and ridge-pieces. The walls within are finished with coloured brickwork without plastering, yellow malms being used up to the springing line of the arches, relieved with a small proportion of red, and above the ground is pale buff, diapered with yellow and red diapers, producing a soft effect; the arches with their soffits are marked by stronger colouring. The four central columns are of Doulting stone, with carved capitals. The ceiling over the central crux will be treated domewise. It is hoped shortly to proceed with the main body of the church.

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CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THIS Association (2, Westminster Chambers), which was formed last summer in consequence of the strike of the building operatives, held a general meeting at the Westminster Palace Hotel on Tuesday last, for the purpose of adopting rules for the permanent constitution of the Association, the object of which is set forth as follows:—

The object of the Association will be the promotion and protection of the interests of the building trade of London generally, and of the members of the Association in particular, by the following amongst other means:—

1. Unity of action in the settlement of all questions arising between employers and their workmen, with a view to prevent lock-outs or unjust strikes against individual members of the Association.

2. The general adoption of equitable conditions of contract, such as those recently agreed to by the Royal Institute of British Architects.

3. The interchange of information and mutual co-operation, when desirable, with other kindred societies throughout the country.

4. The collection and circulation amongst its members of statistics and other information considered to be for the general interests of the trade.

5. The keeping a register at the offices of the Association of foremen and others who can be recommended for employment.

The rules were unanimously adopted, and a permanent committee of twenty-one leading members of the trade was elected by ballot, with ample powers to act for the general welfare, and with power to call an aggregate meeting whenever a strike against any member shall be threatened.

CUTLER'S PATENT SASH-FASTENER AND PLATES.

WE illustrate a new sash fastener recently invented by Mr. S. Cutler, of Ryde, which seems simple and likely to answer its purpose:—

Fig. 1 shows the patent fastener fixed to stile of sashes. Fig. 2 is a section of same, showing position of catch when closed; the dotted line showing position when open. Fig. 3 shows the plates fixed to pulley stile under head-lining for top sash; the dotted line shows position of plates as shown in Fig. 4, when the sash is closed. Fig. 4 shows the plates fixed to top sash. Fig. 5 is the front elevation of sash. Fig. 6 shows the plates fixed to pulley stile above the sill for bottom sash; the dotted line shows the position of the plates as shown in Fig. 7 when the sash is closed. Fig. 7 shows the plates fixed to bottom sash. Fig. 8 is the front elevation of sash.

The plates can readily be fixed to any window; they can be used without the fastener, and will effectually stop the rattling of the sashes, and keep out the draughts and dust, preventing the necessity of using wedges, which damage the paint and beads and create draughts, and which are often mislaid or lost.

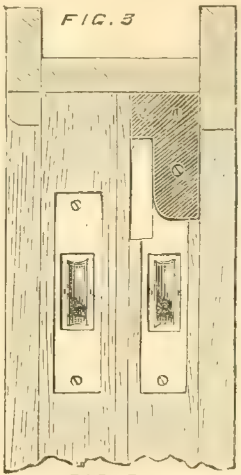
FIG. 3

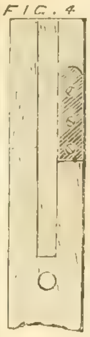
FIG. 4

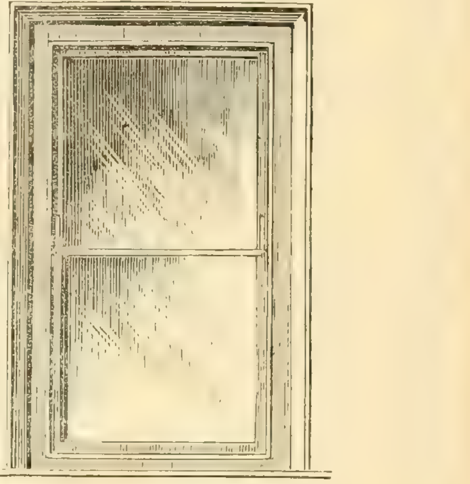
FIG. 1

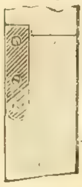
FIG. 7

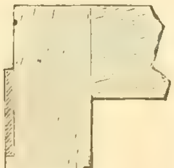
FIG. 5

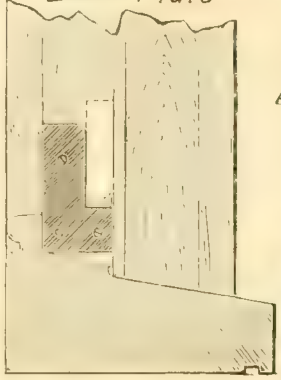
FIG. 6

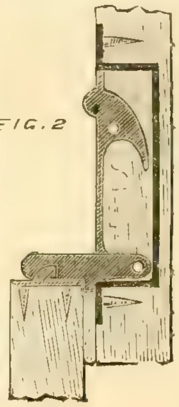
FIG. 2

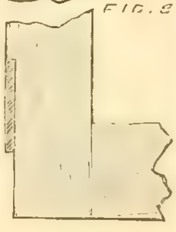
FIG. 8

In fixing the plates it should be seen that the beads on meeting rails are not thicker than the parting beads: if they are, they should be reduced to the same thickness, so that the top and bottom sashes will fit close to the parting bead when the sashes are closed; the plate of sash fastener on the bottom sash can be moved in as far as necessary, just to keep the sashes close together. The top plates will keep the sash up in its proper place, and entirely prevent the straining of sash fastener in order to get it over the bottom sash.

The fasteners are easily fixed—these as well as the plates can be fixed in new work before the sashes and frames leave the joiner's shop. They cannot be opened from the outside, and they save the breaking of the glass often occasioned by the spring of sash fastener flying back against it.

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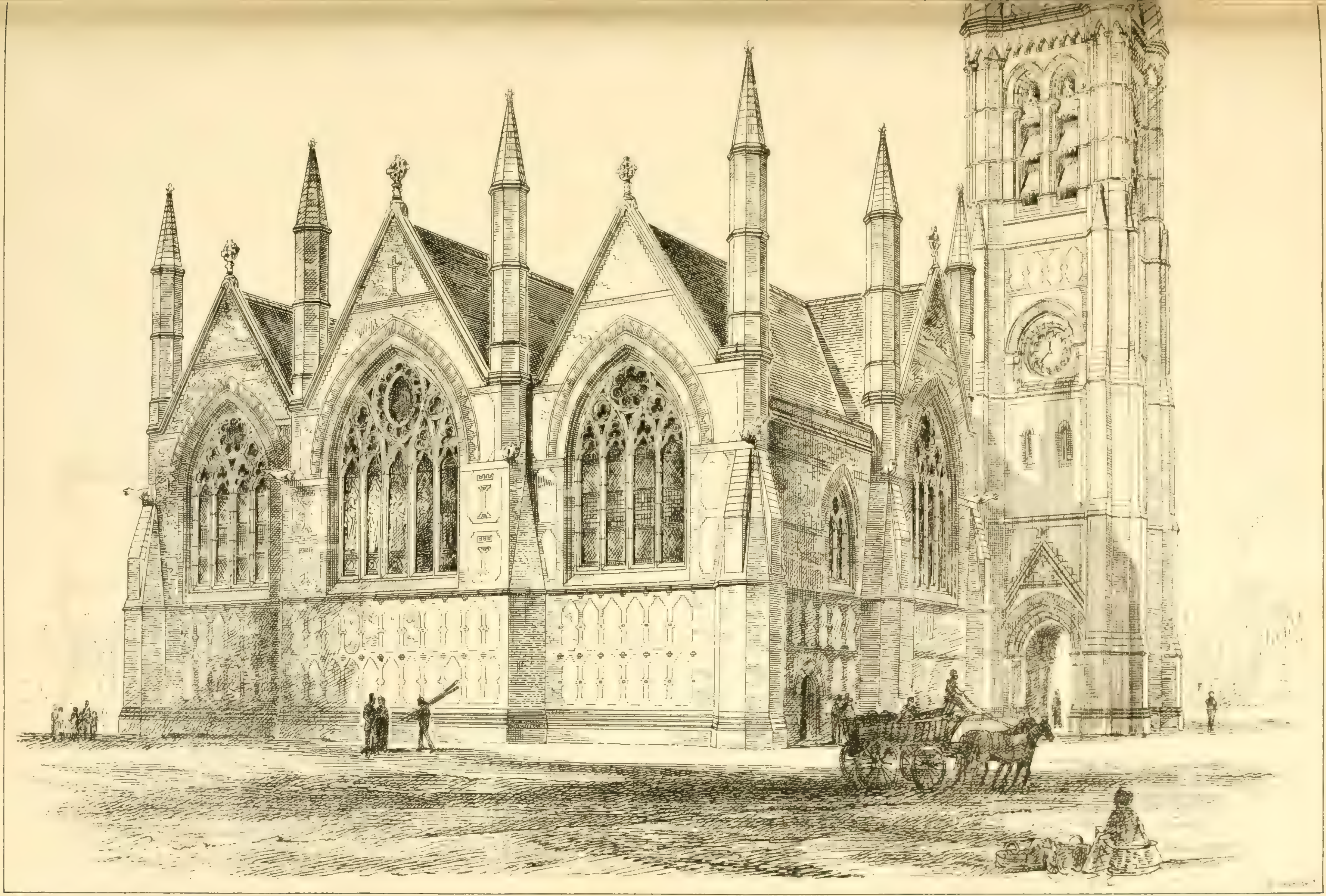
Commenting on the two western towers proposed to be added to Sir Gilbert Scott's design for the new Cathedral at Edinburgh, the *Guardian* observes that it seems to be thought necessary for a cathedral to have western towers, although, as in the present case, the whole building will be on a miniature scale. Some of the finest Gothic cathedrals have or had no such ornaments—for instance, Old St. Paul's, Salisbury, Milan, and others.

COMPETITIONS.

Batley.—At a meeting of the General Purposes Committee on the 30th ult., to consider the plans with reference to the public market, it was resolved "That the design and plan marked, 'Apropos,' for laying out the market land be approved; that the market-house be built on the site as shown on the said design; that the plans marked 'Etudie,' 'Pro Bono Publico,' and 'No Name,' being considered of equal merit, be referred back to the several competitors, with the request that they will alter and adjust them for a market-house and market only, without shops, to suit the approved plan of laying out the land." It was also resolved that the market-house be built 24 yards in length, by the width of the land, as shown on the plan, and so constructed as to be capable of being enlarged afterwards. It was agreed to thank the several unsuccessful competitors.

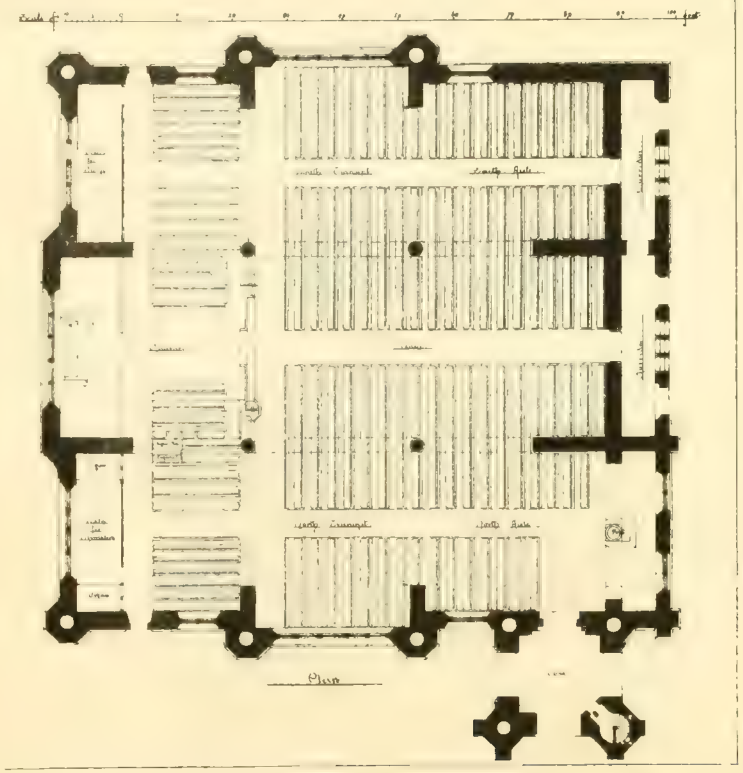
New City Mission House.—Some time since the Committee decided to erect a new mission house. The following architects were invited to send in designs, on a scale of 8ft. to 1in., the drawings not to be perspective:—Messrs. Spalding & Knight, Messrs. Searle & Sons, Messrs. Habershon & Pite, Mr. Bell. The three architects not employed to be paid £15 each for their designs, which were to be sent in under sealed mottoes on or before November 20, and then to be considered the property of the Society. The decision arrived at is in favour of Messrs. Spalding & Knight, and the building is to be erected forthwith upon a permanent site in Blackfriars, opposite the Ludgate Railway Station. The chosen design has a façade in the Italian style in brick and stone, the hall and library being planned in the rear of the ground storey. The maximum price of building to be limited to £7,000; this sum to include the extension of the vaults and footway required, stoves, bell and gasfittings, speaking-tubes, and arrangements for warming, ventilation, and carrying off gas by zinc tubes. The windows to be of plate glass.

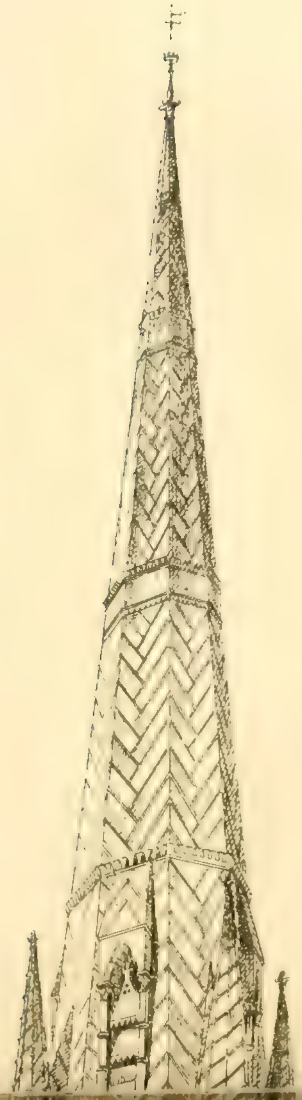
Proposed Baths and Wash-Houses at Paddington.—Nine architects having been invited to compete for the design for this building, a meeting of the Commissioners was held on Tuesday last for the purpose of adjudging the prizes. The first was awarded to Mr. Lewis H. Isaacs, of Verulam-buildings, Gray's-inn, the second to Mr. Collins, of Queen-street, Cheapside, and the third to Mr. Bridgman, of London-wall, the prizes being £100, £75, and £50 respectively. Mr. Isaacs wil proceed at once to prepare the contract drawings. The estimated cost of the proposed structure is £20,000.



ST JAMES CHURCH, GREAT YARMOUTH.

JOHN P. SEDDON, ARCHITECT.


Scale of Feet
10
20
30
40
50
60
70
80
90
100 feet
South Transept
South Aisle
North Transept
North Aisle
Font
Organ
Plan



ON PROFESSIONAL PRACTICE.

LECTURE III.

MR. ROGER SMITH delivered his third lecture on this subject on the 9th inst. Having recapitulated the substance of the two preceding lectures, he proceeded to treat of the subject of drawings. Really good architectural drawings ought to be very distinct, decided, definite, with lines strong, firm, and unwavering. Wherever enrichment or carving had to be put in it ought to be clearly defined; there need not be much of it, but whatever there was should be right and of the correct size. There should be a sufficiency of colour to mark distinctly the different materials, the voids and the solids, the parts in elevation and the parts in section. A good drawing ought to tell very distinctly its own story, and ought not to shirk any difficulties. Difficulties should be worked out as they cropped up, and the drawings should show how such difficulties had been solved. As regarded drawings, like everything else in architectural practice, a wise economy might be exercised in relation to them: he did not mean stinginess or meanness. As many as were wanted should be made, and these as good as could be, but it was a mistake in every way to make an unnecessary profusion of drawings. A distinguished contractor once told him that his impression was that the thing which made the great difference between the successful and the unsuccessful architect was draughtsmanship, and that the best way to become a good architect was to become a good draughtsman. This, if not exactly the truth, was very nearly so, but the reason why architects became good architects was that they understood building. There were certain eminent architects who had carried out excellent buildings, but whose powers of drawing had been exceedingly small. There were one or two living men who certainly deserved the name of good architects who either could not draw at all or could draw only to a slight extent. Such architects were in a great measure dependent upon the skill of their draughtsmen. Mr. Street had once said that the (in his opinion) most advanced Gothic architect of the day could not draw at all. Another distinguished architect, lately deceased, never made a complete drawing of any of his many fine works. In his (the lecturer's) opinion a great many if not all of the fine buildings which had come down to us were built without any such drawings as were used by the modern architect, although of course drawings of some parts must have been requisite. He had no doubt, however, that as architecture became debased, draughtsmanship improved. On the other hand, taking the gentlemen who were known in the present day as distinguished draughtsmen, it would be found that the same gentlemen were also the most accomplished architects of the time. Pugin, in a certain school, was almost unequalled as a draughtsman; and the late Professor Cockerell and Sir Charles Barry were perhaps the two finest draughtsmen of their time. Messrs. Street, Burges, Blomfield, Nesfield, Shaw, Edward Godwin, Waterhouse, Edis, Phené Spiers, and T. H. Watson might be mentioned as notorious among the best draughtsmen of the day, and these certainly constituted a rising and talented school of architects. The subject of architectural drawings might naturally be divided alphabetically under three heads, viz.: D, Designs or preliminary drawings; E, Explanatory or exhibition drawings; and F, Final or working drawings. It was bad economy to be sparing in the making of designs or explanatory drawings, although in the making of the final or working drawings it was often possible and even advisable to be economical. Sometimes, but rarely, the same set of drawings would answer all three purposes—as in the case of small features, such as chimney-pieces, &c. In designing a building for any special purpose the architect should make himself acquainted with what had been done in the same direction by others, and should try to advance upon it if possible. If it was a work in which the artistic character was required to be prominent, as a church, for example, it was the best plan to go and study the best periods of old art, keeping an open eye, however, upon what was being done now by the foremost architects. In making a design for any building different men would proceed in different methods, and it was best for each man to follow his own course. The necessary time and pains should be devoted to getting as accurately as possible the requirements of the building to be designed. There were many little aids in designing which were of value. It was often of considerable assistance to have the paper covered with a certain number of right-lines, and some people adopted the plan of covering the paper with squares, on which they made the plan. He spoke of the plan first of all, because he trusted that all his hearers were convinced that in designing a building it was the proper way to begin with the plan—in other words, it was the proper course to first of all see what a building was going to be rather than what it was going to look like. Sometimes, if not always, they might cut out the squares of all the rooms in paper, and then fit them together in the best way they could to get at the actual plan. It was desirable to draw with ease, and to do this good materials should be used—nice paper, soft pencil, and a good-sized piece of indiarubber. It was extremely undesirable to work to too large a scale; for ordinary purposes he thought the sixteenth scale was about the best to begin with, while if the building was a very large one and required blocking out in sections, the thirty-second, or even a smaller scale, might be used with advantage. Having completed the preliminary design to his satisfaction, the next thing was to work out the design to a larger scale to be submitted to the client. At this stage of the work it was desirable to submit it to a friendly but competent critic. He (the lecturer) had on several occasions felt strongly indebted to some outspoken friends for their criticism and advice. It was undesirable to submit more than one design to a client. The explanatory drawings, whether they were to be submitted to an individual or in competition, were very important. The plans and drawings should, as far as possible, be made so as to be easily understood by those who would have to read them. Perspective drawing was here of very great value in this connection, for in no other way could the general effect of a building be so well shown. Indeed, many architects themselves did not know what their buildings would look like until they were put into perspective. It was sometimes desirable, for instance, in competitions, to give perspective views of individual portions of a design, besides a perspective of the whole. Sometimes a client would not be at all able to comprehend a plan; in such a case it was the best course to make an isometrical drawing of all the main and party walls of the building carried up a short distance from the ground. Where the exterior only was needed to be shown, a good model could be made to the size and shape of the building, and the elevations drawn and pasted on to this block. No point should be omitted or unexplained. In all cases, where possible, a written statement or description of the building should be prepared and given to the client; and this was especially the case with committees. Of course, in the case of a competition, this became a matter of great importance, because the competitor had no chance of coming face to face with the adjudicators. Explanatory or exhibition drawings should be nicely got up. It was a very bad plan to have a series of harlequin colours spread over a drawing. In short, such drawings as those submitted by Mr. Waterhouse in the Law Courts Competition were the very *beau ideal* of explanatory or exhibition drawings. Such drawings should always be kept flat, whether mounted on millboards or strainers or not, and the writing or printing on them should be clear and legible, so as to be easily read. It was comparatively seldom that the explanatory or exhibition drawings could be made available as the working drawings. The contract drawings should be a complete set, displaying all the main parts of the building and a sufficient number of details. They should not run into more sheets than necessary, so as to reduce the cost of copying to a minimum in case several sets are wanted. They should be made to such a scale that they could without difficulty be worked to by men who used the 2ft. rule. This would exclude such scales as a sixth, three-sixteenths, a tenth, or a twelfth, or other fancy scales which had no relation to the inch. Drawings should be made to a sixteenth, an eighth, a quarter, a half, or full size. It was very undesirable that a rough-handed foreman or workman should be continually using his pair of ill-pointed compasses on the drawings. Figuring the plans, although many people were averse to it, might be profitably employed on the ground plan, and the principal heights should be figured. It was not desirable to have many figures on the drawings, except on the ground plans or sections. A very useful thing was to have a vertical scale at the side of the principal sections and elevations; this was very valuable, as it was a check on discrepancies. It was a bad thing for the drawings to be meagre, but much worse for them to be discrepant—*i.e.*, for a thing to be shown differently on separate drawings. Some attention should be given to the plans of the flues. Where there was a large number to be got into one chimney it was advisable to make a careful drawing of them, showing how they came up on each floor. It was as well in making the plans to provide for and show the course of the pipes for water and gas, and also the course which would be available for speaking tubes, &c. Most of the plans would be best drawn to the eighth scale. The quarter scale was of especial use for artistic work, and was the most suitable for sections and elevations. The half-inch scale was the next most useful for making drawings of certain features, and a drawing of a particular feature to this scale would often serve as a key to the whole of a design. Half-full-sized drawings should be eschewed, except under very special circumstances, as there was nothing more deceptive; a detail which would look chaste and refined in the drawing, would appear coarse and repulsive when executed twice the size of the drawing. The contract drawings should be in ink, and when once signed should not go out of the architect's possession, or be altered or touched up in the least. Separate sets of tracings generally had to be made for the builder on the works and for the joiners, &c., at the builder's shops; and now and then it was necessary for the clerk of works to have a set. As a rule the architect could not expect the client to pay for all these tracings, as it was considered that the usual 5 per cent. commission should cover the ordinary drawings. As to the ownership of the drawings, the contract drawings were retained by the builder until his account was settled. The drawings should then be returned to the architect. Doubtless the client was entitled to the drawings which had formed the basis of the contract, but this right was rarely pressed, and the drawings nearly always remained in the architect's possession. If the client asked for the drawings they should be given him; but as a rule they should not be offered to him. In conclusion, the lecturer advocated the acquirement of a thorough knowledge of drawing as the best means of study, and the only vehicle of design.

INDIAN ARCHITECTURE.

LAST Friday evening Captain Lyon lectured at the rooms of the Society of Arts, John-street, Adelphi, on the "Temples and Idols of India," to a crowded audience.

In the course of his remarks he said that thanks to the opening of the Suez Canal, India had become accessible to the tourist, as the yearly-increasing number fully testifies, and he proposed in this lecture to give an account of the temples and idols of India. The two temples near Trichinopoly on the island of Seringum, Mundapa, and Teppa Koales, are very celebrated, and embellished with some of the most wonderful carving in granite that is to be seen. At Madura, the Rome of the Hindus, there is a beautiful mundapum which cost one million sterling, carved out of granite, the galleries of which are formed of carved pillars, each being a solid block of granite 15ft. high. This exquisite piece of workmanship is represented with marvellous delicacy of outline, conveying a very clear idea of the immense time, patience, and skilled labour that must have been bestowed on its erection. There is also to be seen here the golden lotus tank, which the Brahmins assert is fed by the waters of the Ganges, which passes 1,000 miles under the sea for that purpose; the tank is one of the most celebrated throughout India. In continuing the journey south, we come to Streevelliputtur, and there behold the great Juggernaut Car, the finest to be seen in the south. It is constructed out of several smaller ones, and is carved out of the finest ebony, and yearly does it go on its peregrination. Further south there is a little bijou, the most beautiful in the whole of India, being hidden behind a rock. On the authority of a Brahmin high priest, it was excavated and carved in the short space of twelve hours by a son who had become indignant at the slow progress of the temple which his father erected on the other side of the rock. Ramisseram is the most sacred temple of India, some say even more so than Benares. Concerning its sanctity, a poem has been written, called the Ramayana, which fills an enormous volume. There are connected with it marvellous corridors 4,000ft. in length. Here the Hindu pilgrim finishes his pilgrimage, which he began in Scinde, 3,000 miles away. The hardship he undergoes while travelling on foot from north to south of India those only acquainted with the country can realise, to say nothing of the penances to which he condemns himself, such as prostrating himself full length at the end of every mile, and remaining for several minutes with his face buried in the dust, having an iron cage riveted round his neck before he starts, and only to be removed on his arrival at the sacred spot. Here is rest at last: he has performed his pilgrimage; he has conquered all difficulties; he has gained his goal; he looks forward to worldly blessings and immediate beatitude after death, and he forgets all he has undergone in the remembrance that he has earned the right to be permitted to wander and repose in these sacred precincts. Turning northwards and following the coast, we come across Avadea Covill, which, though one of the smallest, is one of the most wonderfully carved temples in India, its chief peculiarity being that the stone forming the pillars is so hard that no chisel can be found to cut it in these degenerate days. At Tanjore, with its magnificent tower 300ft. in height, there is to be seen the celebrated bull of Shiva, weighing 80 tons, which a pilgrim brought in his pocket 500 miles. This would be true, for as tradition goes, the bull was at first in the form of a pebble, and grew to its present size, stopping growing when the English came to quell the Indian Mutiny. The bull dates from the eleventh century. The temple at Tanjore, though a very sacred one, and justly renowned for its beauty, is literally deserted. Still further north, and close to Madras, there is Mahavellipore, or, as it is commonly called, the Seven Pagodas. Nothing excites so much astonishment as this place, and it is doubtful if the world can produce anything more remarkable than the monoliths here to be found. The more we examine them, and the whole place, the greater is our astonishment, while at the same time, we are lost in conjecture as to the motive or purpose for which such an amount of labour and time has been spent in forming these marvellous structures, for no record exists as to when or by whom they were executed. Not one among the many works begun has been finished, and all seem to have been undertaken at once by some enthusiastic rajah, or by people under some strong religious impulse, and all stopped simultaneously, either by the rajah's death, or some other catastrophe. No one can really form any conception as to the elaborate carving here displayed. It is computed that there are 300,000,000 deities worshipped in India. The gods are treated in every respect like a human being; they are washed and dressed, and paid great attention to. The god Ganesa is the most worshipped, being, according to the Hindoo notion, most handsome, both in form and face.

The whole of the views of the lecture, taken from photographs, were exhibited by means of the magic-lantern, and must be considered veritable works of art, upon the production of which much scientific labour and patience must have been bestowed. With the intense heat and glaring light, it is not always easy to obtain a satisfactory outdoor photograph, and Captain Lyon is to be complimented, not only on having brought with him this series of wonderfully clear views, but on exhibiting them in a form in which they were seen at their greatest advantage.

At the conclusion of the lecture, Mr. Foster (the secretary) proposed a vote of thanks, which was warmly received, and the meeting afterwards separated.

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FIRE-PROOF MATERIALS.

Any mineral paint serves to diminish the combustibility of wood, while the oil used in mixing it increases its combustibility in an unequal degree. Oil paints, then, however highly recommended, are of little use in rendering woodwork fire-proof. Several chemical preparations have at various times been proposed, of which the chloride of zinc and soluble glass seemed to be the best. They accomplish the object, but some disadvantages attend their use. The chloride of zinc is volatile at a high temperature, and its vapours are so dangerous that it is impossible to enter a room thus protected, after the woodwork has been subjected to a temperature high enough to ignite ordinary wood. For this reason it would be impossible to rescue persons or property from such a room. Soluble glass, or water-glass, is free from this difficulty, and for use indoors we know of no serious objection that can be urged against it. Exposed to the weather, however, it gradually washes out, leaving the wood, which was at first thoroughly protected, almost as combustible as before.

To obviate these difficulties, Sieburger has proposed to submit the following treatment: A hot saturated solution of three parts alum and one part sulphate of iron is applied to the wood, allowed to dry, and a second coat of the same applied. It is next painted with a dilute solution of sulphate of iron, into which has been stirred enough white potter's clay to make it as thick as a good water-colour paint. One or two coats of this will be required according to the porosity of the wood. The alum and iron solution unites with the constituents of the wood to form insoluble compounds, which cannot be washed out as easily as water glass. The unctuous clay farther prevents moisture from penetrating the wood.

Another method, which has been tried with excellent results, consists in applying hot glue water as long as it continues to soak in. When a film of glue remains on the surface, another coat of thicker boiled glue is applied, which, while fresh, is sprinkled with a powder consisting of one part sulphur, one part ochre or clay, and six parts sulphate of iron, previously finely powdered and well mixed.

The *American Artisan* says: Is it possible to build sure? Can a totally fire-proof building be made? To believe that this is impossible would be greatly to depreciate the mechanical and scientific resources of the age. Nothing can burn till heated to the temperature at which it combines with oxygen; the problem of fire-proofing will then be solved when we discover the means by which the temperature of combustibles can be kept from reaching the temperature of combustion. We can apply the most intense heat to steam-boilers without burning them. Why? Because each atom of water they contain is a swift vehicle to seize upon and carry away heat. Let us make up the partition of walls of buildings in a manner analogous to sectional steam-boilers, and no fire would be communicated from one building to another. A thing so evident should have attracted the attention of architects long before this. In this way, iron, which by itself is not a fire-proofing material, can, by the most economical use of water, be made to withstand the severest ordeal. The iron-enclosed water-spaces need not be more than 1in. in thickness, and need never be subjected to a hydraulic pressure of more than 3ft. or 4ft. head. These walls can, therefore, be made of thin metal. They can be supplied with water from the common water-service, or from tanks placed at the tops of buildings. In case of fire, the turning of a single cock would supply them with water, and the temperature of the partitions could never rise above 212° Fahr. till the water had all boiled away. In this way, not a tithe of the water now vainly used to extinguish such fires as those of Chicago and Boston would be needed to preserve a whole city.

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THE AMERICAN INSTITUTE OF ARCHITECTS.

The sixth annual convention of the American Institute of Architects has this year been held in the city of Cincinnati. It commenced on the 12th ult., a private business meeting in the morning being followed by an afternoon session at 3 o'clock, which was called to order by Mr. Carl Pfeiffer, of New York, who, in the absence of the President, Mr. Richard Upjohn, of New York, called Mr. R. G. Hatfield, First Vice-President, to the chair. The following delegates were present:—Fellows—Edward Anderson, Arthur Bate, A. J. Bloor, Walter Blythe, J. C. Cochrane, R. G. Hatfield, Charles W. Heard, Joseph Ireland, J. W. McLaughlin, H. E. Meyer, Albert G. Wash, Carl Pfeiffer, G. W. Rogers, H. A. Simms, Wm. Lively, Wm. R. Ware, J. K. Wilson. Associates—Henry Brauns, Henry Bevis, C. P. Thomas.

Mr. **Hatfield**, upon taking the chair, read the annual address. It deprecated the underbidding style of competition prevalent among too many architects, and urged a higher professional tone in this regard. The opening passages reviewed the improvement in architecture during the last ten years, and maintained that there was ground for still greater progress during the next ten. The best road to this improvement the writer believed was the adoption of a system of specialties, which, indeed, was the cardinal idea of the address. The reading was followed by applause, and a vote of thanks passed, upon the motion of Mr. J. C. Cochrane, of Chicago.

The **Secretary** then read the annual report of the Board of Trustees, which was adopted. It showed the work of the Institute, setting forth that much had been done in the way of corresponding with foreign architects, who manifested a warm interest in the work, and had frequently sent competitive designs.

The **Treasurer**'s report was then read, showing a balance of 875dols. 24c.

Mr. **Wm. R. Ware**, of Boston, the Chairman of the Committee on Education, then read an exceedingly interesting report, strongly urging the necessity of regular studies in architectural schools as preparation for office work, and reviewing the status of the architectural schools and departments in colleges throughout the country.

The Secretary of the Committee for Library and Publications then presented a report, and stated that offers of assistance and good wishes had been received from the London Building News.

The reports of Chapters occupied most of the remaining hours of the afternoon.

The report of the New York Chapter, Mr. A. J. Bloor, secretary, contained the following extract:—"In the last annual report of the secretary of the New York Chapter, he alluded to the destruction which had recently fallen on the great North-Western city of the Union through the constructive defects of the buildings destroyed, such defects being presumably owing to the narrow provincialism of mechanical handicraft and the short-sighted selfishness of commercial speculation, not being guided and tempered by the judicial and benign authority of thoroughly and broadly educated experts. But while he is writing these words, undetailed, but only too sure, information is received that one of the oldest and, in all respects, both moral and physical, most substantial cities in the country is being devoured by the same terrible agency which created such disaster in Chicago and all its business relations thirteen months ago. The imperfect accounts as yet received convey the impression that, though no expense, however great, had been spared in erecting the massive granite structures just leveled by fire in Boston, yet that all was rendered of no account by the dominancy of the Mansard type in the roof construction of the burnt district. Now, if this be so, the blame, however it should be shared by employers for imposing the caprices of building fashion on their architectural advisers, will undoubtedly be laid by the public chiefly on the latter, and the moral to be educed for the New York Chapter, as well as for all its fellow Chapters, from these recurrent and stupendous disasters, is that architects, by a thoroughly rounded and not one-sided education, either in themselves individually, or in conjunction with their assistants, should be qualified to take an *ex-cathedra* stand in their dealings with employers, and to insist on having their own way in the buildings entrusted to them; or, failing to secure their employer's concurrence, be able to hold the latter distinctly to the responsibility of whatever avoidable disaster and destruction may befall their structures."

Mr. **Henry A. Simms**, of Philadelphia, secretary, then read a report of his former correspondence. It was a very voluminous document, but was full of matter of interest to the profession, including information and comments upon the severity and general effect of the architectural laws in Russia, the Society for "The Propagation of Architecture in the Low Countries," and societies elsewhere, and correspondence with distinguished members of the profession abroad.

At the evening session the following officers were elected for the ensuing year:—President: Richard Upjohn.—Board of Trustees: Henry Dudley, R. M. Hunt, A. J. Bloor, and C. C. Haight.—Treasurer: R. G. Hatfield.—Secretary: Carl Pfeiffer.—Secretary of Foreign Correspondence: H. A. Simms.—Committee on Education: Mr. Ware, Boston; Dr. Walter, Philadelphia; Mr. Hutton, Baltimore; Mr. Nash, Cincinnati; Mr. Wight, Chicago.—Committee on Library and Publications: Messrs. Little, Bloor, Holly, Pfeiffer, and Gambrill.

Mr. **James K. Wilson**, of Cincinnati, from the Committee on Professional Practice, read an elaborate report, in which the following questions on architectural ethics were proposed for discussion: 1. Would it not be well for architects never to volunteer their services, but to wait the applications of clients?—2. Should not the price of work be scaled according to the experience and training of the architects?—The Committee suggested that whatever rules were adopted on the subject should be advisory and not obligatory upon Fellows and Associates of the Institute. The report was adopted. A vote of thanks was tendered to the publishers of the London Building News for the publicity given to the objects and proceedings of the Institute in their columns. Thanks were also voted to the Philadelphia Chapter for inaugurating the system of social *conversazioni* and exhibitions of drawings, and other Chapters were recommended to adopt the practice.

At the afternoon session on the following day, Mr. N. H. **Hutton**, of Baltimore, read a paper on the subject of "Cements." In the course of his observations, he referred to some of the tests of the strength of cement. One of them, he said, is its weight, the increase of strength being in a rapidly increasing proportion to its increase of weight. For instance, some of the American cements weigh 67 pounds to the struck bushel, and their tensile strength is 70 pounds to the square inch, while an English cement, weighing 110 pounds to the bushel, has a tensile strength of 178 pounds to the square inch. This subject naturally suggested the question of a fireproof cement for roofing. Mr. Hutton stated that he had used in roofing a cement, or concrete, containing six volumes of lime with one volume of imported asphalte, not the prepared article. The asphalte must first be reduced to a liquid state by the addition of three times its quantity of ordinary coal-tar. With this he had made severe fire tests, and found it proof against the destroying element. He had found many concretes, but few of them were of any value.

Mr. A. C. Nash, of Cincinnati, then read a paper in defence of Mansard roofs, as follows:—Within the past year, or nearly within this time, we have been obliged to chronicle the destruction of the main business portion of two noted cities—one, the city that was the cradle in which a nation was born and nursed, and the other the most perfect type of the spirit of that nation. In each city there were quite a number of what have hitherto been regarded fireproof buildings. In one city there were many wooden buildings, which, owing to the unparalleled growth of the city, were not replaced with modern and more substantial structures; these again were interlarded with lumber yards, cooper shops, &c.—it is true, fast disappearing by the rapid march of improvement—but yet sufficient in number and bulk of combustible material to render any intervening vacant lots that there may be very unsafe as storages for gunpowder or naphtha. In the other city, as I understand it from a very limited sojourn there, and from hearsay, the burnt district embraces within its limits substantial blocks of granite, many of them fireproof, and no wooden structures, no lumber yards, no cooper shops, no turpentine factories—all solid, substantial buildings of granite. Granite? But there were Mansard roofs; "aye there's the rub;" Mansard roofs. There were too many of these Mansard roofs. The thinking public, who have become posted in the science of building in a day, have so decided, and Mansard roofs must be discarded hereafter—should have been before. A law as unalterable as the laws of the Medes and Persians should have been made by the municipal authorities, making it a criminal offence for one to put on a Mansard roof; for Mansard roofs have all the qualities and are entirely governed and controlled by the laws (all the laws) of spontaneous combustion. Wooden buildings may be mowed down like chaff before the fire. Granite may be shattered to atoms when subjected to the combined ordeal of the elements of fire and water. Yet, if there are no Mansard roofs, and this result happens, it is all accounted for by the natural course of things—the fire started at the bottom and burnt upward; but in a reversed case nature, with a peculiar freak of hers, reverses her laws, commences at the top and burns downward. In the language of the immortal Artemus Ward, "Why is this thus?" Can nature change her laws, hitherto regarded as fixed, immutable? I believe not. Before abandoning a feature which has contributed so much to the scope of design in beautifying strict architecture, a never ending source of distinctive ideas, which break up monotony, mark a building, and attract the attention to a minor individuality expressed in necessarily tamer and less prominent features, below the cornice, thus making the whole structure more distinctive. I have often thought that the term "block," for a pile of buildings, originated in their general expressionless resemblance of a "block" to a cube; made distinctive only by a more or less sized opening, or form of window cap, or projecting balcony—as we recognise a man by his contracted or capacious mouth, or his favour with nature in the way of a proboscis, his features not being particularly distinguishable across the street—a feature that has contributed more to picturesque effect in isolated structures, and in domestic architecture generally, than any one idea that has been advanced since their invention. I say, before we abandon a roof which has done so much for architectural æsthetics; which has, withal, been in use these three hundred years; which demonstrably has caused no fires, has assisted no fires, has been the means of extending no fires in the city of their birth and of their general adoption, and, as I believe, nowhere else when properly constructed—and which has only recently been unreasonably attacked, seemingly because it could not prevent fire—because it burnt where wood burnt and granite crumbled—before discarding this roof, would it not be well to inquire whether there is any other cause for combustion than the mere fact of the existence of a Mansard roof? Do buildings without ever burn? Have thickly interspersed wooden structures anything to do with extending a fire—has not this long line, and tier upon tier of immense wooden signs, awnings, and wooden window-frames, wooden dormer windows, wooden copings, wooden cornices—the absence of proper (if any) party walls, the spaces between furring not stopped off on each floor by a belt of mortar, or otherwise to prevent an upward current of air, open hatchways, wooden shafts for air, light, or transportation of goods, wooden columns, wooden trusses, in fact, wood in any exposed form; or flues, with 4in. walls, no pargetting, and wood to the front of them, wood to the right of them, wood to the left of them, wood in, around, and through them? In short, has not the indiscriminate and exceedingly careless use of wood, and the criminally careless construction of flues, more to do with the general condemnation of Mansard roofs than has the mere form or inclination of the roof? And this brings me to the consideration of the proper construction of flues, the greatest ally and abettor of destructive fires next after Mansard roofs, and which is altogether too vast a field to wade through at this time, and I beg pardon that, in the hope of making a suggestion or two, I have trespassed so far upon your valuable time.

Mr. Ware, of Boston, said in reply, it was not true that the Mansard roof would burn any more than other roofs; it was only more combustible in the proportion that it contained more combustible material. And, as commonly constructed in this country, there was no doubt it had more wood in it. The numerous dormers increase the quantity of wood. The chief reason for the Mansard roof is its opportunity for putting out decorations, and these being generally of wood increase the danger. He did not believe the danger from fire to these roofs arose from its material more than from its form. In regard to the immunity of the Paris Mansards mentioned by Mr. Nash, he believed it was true that even in the great fires in that city, during the late war, the fires did not spread. But the Paris Mansard was different from the American type. It was like a greenhouse, a converse curve in the roof. The framework was of wrought iron, the larger ribs being wrought iron with smaller pieces connecting like ordinary sash, being intersluices about 10in. by 12in. These are not fitted with glass, but with plaster of Paris. This expands slightly in setting, and remains firm; then the outside is covered with zinc or copper, or some other metal, and forms a fireproof roof. The dormers are also constructed with iron, and the same material as the roof. He was of opinion that if something practicable could be done in this country toward supplying the place of plaster of Paris with some concrete or artificial stone, of which we are continually hearing, then the great objection to the Mansard would disappear. He thought much might be done by the use of iron of lighter patterns than is usually employed.

The Boston fire was not a surprise to those who had given it attention. Those buildings were compactly located, with narrow streets intervening; their walls, scarcely more than pillars, filling the space between the windows; very high, and surmounted with the wooden structure common to the Mansard roof. The conditions were most favourable for a great fire, and in West Boston the same difficulty is to be found.

Mr. A. J. Bloor, of New York, offered the following resolution, which was unanimously adopted:—"Whereas, the type of roof called Mansard is justly held in great estimation by architects on account of the opportunities it offers for available space above the cornice line, and for exterior effect. Resolved, that a committee of three be appointed to prepare a paper showing the best modes for preparing Mansard roofs which shall be as fireproof as their substructures." The chair appointed Mr. Bloor, of New York, Mr. Nash, of Cincinnati, and Mr. Hutton, of Baltimore.

Mr. Carl Pfeiffer offered the following, which was adopted:—"Resolved, that the experience of Boston and Chicago serves to show that it is of the greatest moment to the community that some mode of constructing fireproof roofs, not too expensive for universal use, should be devised, and that the attention of architects and engineers is invited to this important subject."

The closing address was delivered by the Hon. Rufus King, and in the evening the members dined together with a few invited guests.

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ON WARMING AND VENTILATING HOUSES.

By J. P. Seddon, F.R.I.B.A.

(*Concluded from page 457.*)

Even the ordinary grates may be improved by getting common pipeclay, and modelling it to the shape suggested, covering bottom, sides, and back, and lighting a fire of sticks within to dry it. This will last from two to three years with care, and is not costly to replace.

It is possible, however, while saving at the spigot to lose at the bung-hole; or, while careful about the parlour fire, to draw unduly at the coal-cellar for the kitchen range. The ordinary close range, though one of the best inventions of the age, is usually greedy of fuel. If it has, as it may, to aid in warming the house, and ventilate by extraction of foul air, and to heat water for baths, as well as to cook, it will need to be correspondingly fed. The Cromer range has been arranged specially, at my suggestion, to meet the varied demands of cottage and mansion with the smallest expenditure of coal, by Mr. John Barber, engineer, of Leeds, to whom I am in the habit of sending all problems of this kind which arise in my practice to be worked out.

With regard to stoves, if we could forego the cheerful open fire, we might, without doubt, obtain warmth with greater economy in sitting-rooms; but until then, stoves are more applicable for halls and corridors. They should never be used merely to heat stagnant air, but always have fresh brought to them from outside, that they may serve as fountains of pure warm air to the house.

Some stoves are so constructed as to have hollow pipes or spaces through which fresh air enters. Those that have not should be placed over gratings in the hearths, to which fresh air is brought, and this, rising around them, is warmed, and provides the requisite supply in an agreeable manner.

Stoves wholly of iron are apt to overheat, or what is called burn, the air passing through or in contact with them. Hence an unpleasant odour, which arises from particles suspended in the air becoming carbonised. This must be unwholesome, even though disguised and rendered less disagreeable by the evaporation of water placed on or around the stove. To this effect, from water placed in pans at the bottom of the gill stoves of the London Warming and Ventilating Company (largely employed for heating public buildings), is attributed the spreading of the heat generated throughout the interior, so that the remoter portions, as well as the nearer ones, receive the benefit thereof.*

It is, however, in my opinion, better to avoid this evil of the carbonisation of the particles in the air, than to palliate it by the addition of unnecessary moisture. This can be done by constructing the air-warming portion of the stove of fireclay or earthenware, perforated with air-passages, and to encase it in iron, with a space left between the two materials. Fire-clay, from its greater bulk and power of absorbing heat, is far less apt to injure the air passing in contact with it. This is effected by Pierce's (now Penfold's) pyro-pneumatic stove, which has also the advantage of having an open fire.

Gill stoves are those which have the material of their firebox set with projecting plates, to increase their heating surface, and reduce the chance of burning the air by spreading the heat from the same amount of fuel over a larger space. The undoubtedly great heating power of gill stoves is, however, due rather to the form than area of this surface, since the air thus heated in the narrow channels rises rapidly in sheets, and its place becomes supplied with cooler air from below; the current is swift and constant, and the period of contact is too short for the air to become overheated. Earthenware may be corrugated in form for the same purpose.

Many of the gill stoves are, however, apt to emit sulphurous fumes from their furnace-doors, because the upward current of heated air from the gills is frequently so strong as to exceed the draught of the chimney, and draw some of the products of combustion from the fire into the apartment. This was recently found to be the case with almost all the stoves in York Cathedral at the same time.

To remedy this defect in the gill stoves, and to reduce the consumption of fuel in them, which is larger than it should be, I recently requested Mr. Barber to design some for me specially, for heating churches, schools, and halls of dwellings. Having established the fact that slow combustion of fuel and sluggish draught are essential items of economy, especially in these stoves, he prevented the column of heated air from the gills coming in contact with the air surrounding the furnace-door by portioning it off into a separate compartment when the stoves are set in brickwork in a cellar or crypt, and by placing a hood or shield over the fire-door, when not set in brickwork. These stoves Mr. Barber calls "The Cromer Stoves." George's Coal Calorigen forms an excellent warm-air fountain upon a scale suitable for ordinary use in houses, and Whitaker and Constantine's Convoluted Stove a good and powerful one for introduction into a basement for heating a larger building.

Gas, at present, with the appliances in use, does not contrast favourably with coal in point of economy as a means of warming houses where the work is continuous, but may yet be made very serviceable, and even economically so, upon occasion.

It can be turned on at a moment's notice, and its full effect attained speedily; it demands little attention and causes no work, and is extinguished as suddenly as it was kindled.

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* These stoves certainly have an extraordinary effect in this respect. In a church in which I had placed four simple gill stoves in good positions, without success as regards warming the interior, one of the company's stoves substituted for them, and placed in a comparatively disadvantageous position, in an adjunct to an aisle, gave perfect satisfaction, even to the distant portion of the main erection. It is to the effect of the water that the company attributes this result; whether quite rightly so, I am unable to determine.

These qualities commend it for studies, bed and dressing rooms, and wherever heat may be needed quickly and for a short time only. It can be made cheerful in appearance, making lumps of asbestos, &c., glow with heat, as red-hot coals.

Mr. Hammond, gas engineer, of Chandos-street, informs me that, according to experiments he has made, a coal-fire maintained by 20lb. of coal at a cost of 3½d., when the price is 30s. per ton, will produce as good a result as the combustion of 200ft. of gas, which costs 9d., at 3s. 9d. per 1,000, both fires being ten hours in action. But he states that when the work is occasional, intermittent, or for short periods, and the waste in lighting up taken into account, gas is not only more cleanly and convenient, but far cheaper than coal, and when coal-fires necessitate extra cost for attendance, this will frequently make gas the cheaper heating agent. Mr. James Thompson found, by an average of 36 experiments, that he had to consume 4½lb. of coals —value, with lighting wood at present prices, nine-tenths of a penny—to raise one gallon of water to boiling-point; 4 cubic feet of gas costing two-tenths of a penny, doing the same work at less than one-fourth of the cost.

There is a grate of French invention in which a ring of gas, burning out of sight above the opening, throws a brilliant glare upon a polished reflecting metal bottom and back, which radiate heat well, and have a pleasing effect. The cleanliness and beauty of this would make it very applicable to secondary fireplaces in a suite of saloons.

George's Gas Calorigen cleverly disposes of the products of combustion by the same pipe which admits the air supply for the purpose, and provides the apartment with fresh air warmed in passage through another pipe heated by a ring of gas-jets.

All these gas-stoves, as indeed gas-illuminating burners, should, if to be tolerated, have flues to conduct out of the house the products of combustion; but Dr. Taylor claims to have invented a "self-purifying gas-stove," with a chemical substance by which the noxious products passing are decomposed. For these Messrs. Hodge, of 100, Hatton Garden, are agents, and if their promise be realised, they solve a difficult problem, and may tend to the wider introduction of gas as a heating medium for houses.

Mr. Barber has worked out, and Mr. Hammond, of Chandos-street, executed, a gas apparatus of my invention, intended to be placed in recesses within the backs of windows, to warm air entering thence. It is provided with exit for the products of combustion, which might possibly be dispensed with on Dr. Taylor's system. The air admitted from outside passes through a number of tubes, round which a ring of Bunsen's gas-jets is made to play. By these the atmosphere is admitted with the gas, and burned with the flue-flame, which gives out more heat than the illuminating yellow flame of gas.

Gas being the essence of coal, as it were, I feel convinced that it is possible to use it economically, as other essences are now used, and I believe that chimneys, grates, chimney-pieces, fenders, fire-irons, coal-cellars, domestic scrubbing, and chimney-sweeping might all be abolished, with the dirt and dust of ashes, and danger of fire diminished, at a vast saving of cost, by the introduction of some such means of warming houses as I have thus suggested. Gas-stoves constructed with rapid circulation like gill-stoves, disposing satisfactorily of the products of combustion and warming the air by the inlets to be provided for general ventilation, would, I believe, warm houses cheaper than coal fires at present price of gas, when account has been taken of the saving in cost of building, furnishing, and maintaining in order, all the provisions and appliances necessary for ordinary grates and stoves.

Since this suggestion was made, Mr. Barber, during a professional visit to Denmark, became acquainted with Mr. Gloesel, of Aarhems, a successful inventor of gas-stoves for cooking and heating purposes, and had the advantage of discussing the subject with him. He found that these stoves had no pipe nor flue to take away the products of combustion, and sat for hours in a room heated by one without experiencing any smell from it, and tested it by going into the outer air and returning to the room, and no effect was produced upon the brass or gilt articles in the room, which is a further proof. Gas at Aarhems is made from coal shipped from Newcastle, and supplied to householders at 4s. 3d. per 1,000 cubic feet for cooking and heating, and 6d. 6d. for lighting purposes, supplied from the same mains; the object being to promote greater consumption for cooking purposes in summer time. In the town of Randers, Mr. Gloesel has heated a public building economically by placing one of his gas-stoves in each window recess and admitting fresh air below, almost precisely as we have proposed.

A crucial test whether the absence of a flue to remove the products of combustion is a safe method to adopt, would be to try the effect of Dr. Taylor's and Mr. Gloesel's stoves to heat a greenhouse, for if plants will live and grow in the atmosphere, there can be no injurious effect upon mankind.

I have now reviewed the several existing appliances and modes of warming houses, and endeavoured to show what are their essential requisites, and how those that are deficient may be improved and rendered more wholesome and economical; and have further thrown out a suggestion of a novel system which might be adopted in the house of the future, the worst feature of which might be that it would hand us over helpless to the tender mercies of the gas companies, which would consequently need to be reformed, as present experience proves.

In conclusion, I can only refer to propositions that have been put forward for the economising of fuel by what I may term adulterating it. Chalk has been recommended for the purpose, but I am at a loss to understand how that can do other than absorb heat during its conversion into lime, which it does not evolve until slaked by the application of water. The mechanical separation of the particles of fuel may, however, tend to prevent waste of their heat and the plan may be worth trial in chalk districts. In other localities clay is a useful medium for mixing with and utilising small coal, and may be recommended for wider adoption, but the axiom, to which I hinted when commencing, will be found to hold good: "*Ex nihilo nil fit.*"

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THE INSTITUTION OF CIVIL ENGINEERS.

THE fifty-fifth annual meeting of the members of this corporation was held on Tuesday evening, the President, Mr. Hawksley, being in the chair. From the report of the Council it appeared that one of the matters which first engaged attention was the decoration of the building, the walls of which had not been considered sufficiently dry, since the enlargement of the premises, to admit of this work being satisfactorily accomplished at an earlier period. The architect, Mr. T. H. Wyatt, was requested to mature plans for the purpose, and they have been successfully carried into execution by Messrs. J. G. Crace & Sons. The alterations made during the vacation had included a great addition to the book-shelf accommodation in the library—an addition rendered necessary by the recent large accessions—by presentation, by bequest, and by purchase. The library now contained about 11,000 volumes, almost exclusively devoted to mechanical science and engineering, and as a technical collection, confined to a special subject, it was believed to be without rival. The enumeration of the papers read and discussed at the ordinary meetings and the two volumes of "Minutes of Proceedings" issued in the recess showed that opinions had been elicited on many different branches of professional practice. There had likewise been a short series of supplemental meetings, to enable the students to read and discuss papers among themselves. The Council had learnt with satisfaction that the members who presided on these occasions were favourably impressed with the value of such meetings; and that the aptitude, the intelligent discrimination, and the apparent sustained attention throughout which characterised those taking part in and present at these proceedings were a pledge that the students would continue to exert themselves for their own improvement, as well as for the benefit of their fellow students. During the session, 17 associates had been transferred to the class of members. The elections had comprised three honorary members 22 members, and 115 associates, while two associates had been restored to the register, making a total of 142. The losses by deaths, resignations, and erasures had been 45, so that the effective increase was 97, or at the rate of nearly 5½ per cent. in the past 12 months. Of the 3,024 members of the various classes elected into the Institution since its foundation, on the 2nd of January, 1818, nearly two-thirds (actually 1,929) were still on the books. Since the last annual meeting 64 students had been admitted, and 30 had been from various causes removed from the list. There were on the books on the 30th of November last 16 honorary members, 752 members, 1,115 associates, and 237 students, together 2,120, as compared with 1,000 ten years ago. With respect to the financial position, last year the income proper amounted to £6,574 10s. 8d., to which must be added for fees and building and publication funds on election and life compositions, £1,294 4s. 6d.; and for dividends on trust funds, £411 3s. 3d.—making a total of £8,279 17s. 5d. On the debit side of the account, the ordinary disbursements were £5,221 18s. 11d., and for premiums under trust, £219 18s. 9d. It had thus been possible to invest for the permanent use and advantage of the society a sum of £2,908 18s. 9d., besides the Howard bequest of £500. The nominal or par value of the institution funds now amounted to £14,994 1s. 8d., and of the conditional trusts to £13,389 13s. 2d., while the cash balance was £270 15s. 1d.—together £28,654 9s. 11d. as compared with £25,373 3s. 4d. at the date of the last report. After the reading and adoption of the report, the President presented Telford medals and premiums to Messrs. B. Leslie, Carl Siemens, W. Bell, J. H. Latham, and G. Gordon; Telford premiums to Messrs. F. A. Abel, F.R.S., and B. Britten; the Manby premiums to Mr. C. Andrews; and Miller prizes to Messrs. O. Brown, A. T. Atchison, J. Addy, A. E. Preston, and W. P. Orchard. The ballot for officers for the ensuing year resulted in the election of Thomas Hawksley, president; John Frederic Bateman, Thomas Elliott Harrison, George Willoughby Hemans, and George Robert Stephenson, vice-presidents; James Abernethy, Sir W. G. Armstrong, C.B., W. H. Barlow, J. W. Bazalgette, C.B., George Berkley, F. C. Bramwell, G. B. Bruce, James Brunlees, Sir John Coode, C. William Siemens, Sir Joseph Whitworth, and Edward Woods, members; and J. T. Chance, David Forbes, and James Grierson, associates.

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DISEASE, VENTILATION, AND ARCHITECTURE.

THE following is an extract from the *Lancet*, December 14, on "The Relative Frequency of Disease between the Right and Left Sides of the Heart," by Cornelius Black, M.D. Lond., M.R.C.P.:—

"To secure the necessary supply of pure air within doors, ample space and perfect ventilation are indispensable. In the present construction of our dwellings these requisites are seldom indeed to be found. The eye may have been pleased, the pocket considered, but health has scarcely received a passing thought in the question of these erections. Architecture has much to undo, much to learn, before it can satisfy the simple laws of nature. In ignorance of these laws houses are built, stately edifices erected, and no thought or care is taken to render the air within as pure as the air without. It is, nevertheless, easy to accomplish this desideratum; but blind, unyielding ignorance chains death in every room.

No system of ventilation can be perfect which does not provide for a constant inflow into our rooms of an ample supply of fresh, pure air without draught, and for an equal outflow of the air already breathed, and of the carbonic acid generated by respiration and by combustion. If these provisions do not exist, carbonic acid accumulates in the air of occupied apartments, and renders it at length poisonous to life. When rooms are felt to be oppressive, hot, and stifling, the too-ready practice is to throw open the windows, under the belief that complete ventilation will thus be accomplished. False reasoning! Delusive error! No sooner are the windows opened than in rushes a volume of cold air, driving the heated air and carbonic acid before it through open inner doors into other apartments, and often forcing them up the well of the staircase into chambers above, in which the carbonic acid, as it cools, descends upon any occupants therein, and passes at each inspiration into their lungs. It is an error to suppose that carbonic acid, by reason of its greater specific gravity than common air, always seeks the ground. It, on the contrary, is rarefied by heat and ascends to the ceiling of the room, from which it gradually descends as it cools, and is thus brought to the level of the breath draught of the occupants. When the ceiling of a room is low-pitched, with the doors closed, and gas and fire burning, the carbonic acid generated floats for a short time above the breathing level of the occupants; but as it passes from the more heated parts of the room to those whose temperature is lower, it cools, descends, and very quickly comes within the respiratory grasp. It is manifest that the true principle of ventilation must ensure the escape of this poisonous air at the highest level of the room, or at least at a height which is above the breathing-level of every individual. To effect this object, the inflowing air ought to be admitted at the same level, where its increased density and velocity will enable it to drive the foul, heated air before it to the outlet, through which it will escape into the great ocean of atmosphere without. Now, the admission of fresh air at this level will be productive of another important advantage, for, as the air distributes itself and descends, it will become gradually warmed, and, when it comes into contact with the living body, it will neither produce the sensation of cold nor will it excite the sensibility of the most delicate heart or lungs.

By proper calculation as to the quantity of oxygen which will be consumed and of carbonic acid which will be generated by the respiration of a given number of persons, by gas-jets, and by fire, the admission of fresh air into a room may be so regulated and proportioned that the oxygen of this included air shall not undergo any sensible diminution, and that the removal of the pre-breathed air shall be effected as rapidly as it escapes from the lungs.

An atmosphere thus changed and thus purified is an important element in the treatment of every form of heart disease. In the degenerations which I have been considering it is especially necessary; because it offers the most efficient means of removing by its oxygen the carbon which has accumulated in the system as the consequence of defective ventilation. and of preventing, by complete oxidation, that partial conversion only of the muscular fibre of the heart which effects its transformation into fat.

Whenever there is manifested by a patient the disposition to exclude the fresh air, and to immure himself at all times in the pestiferous atmosphere of over-heated, ill-ventilated apartments, the desire must be opposed with an authority and an influence which belong only to a medical man. If the habit be allowed the day of danger and retribution will inevitably follow."

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THE WEATHER AND ITS EFFECTS.

THAT extraordinary personage, "the oldest inhabitant," cannot remember more extraordinary weather than has visited Europe during the last few weeks. We have had hurricanes, meteor showers, and an unlimited quantity of rain. And these phenomena have visited our part of the world, almost from the equator to the poles. The same wail of sorrow comes from Denmark and from Italy, where we hear subscriptions have been organised to relieve the distress occasioned by inundated rivers and injured towns and villages. The fog, says the *Daily News*, which rested on the metropolis on Monday, melted away into a deluge of rain, and on that evening one of the most violent storms of the season swept over the Northern and Midland counties. From nearly all parts of England there has come news of disastrous floods. Near home the Thames is flooded, and the meadows all along its banks are submerged. At Banbury the Cherwell was flowing through the Great Western Station; the Leam, at Leamington, had stopped one of the bridges; while the Avon, which flows by Warwick Castle, had made the whole of the country between the towns a vast lake. Farther west, the Stour had risen higher than it has been known to do for twenty years; at Kidderminster one of the chief thoroughfares is under water, cellars are flooded, and shops and mills are unapproachable, and people have been driven from their houses to take refuge with neighbours. At Worcester the meadows by the Avon are now the bed of the stream, which in many places has risen to the house-doors; and the whole vale of Evesham is deluged. Still farther west, the route of the Cambrian Railway is an inland sea. The Verniew has covered the country for miles round Llanymynech. At the junction of the Cambrian Railway with the London and North-Western line the Severn has overflowed its banks till nothing breaks the monotony of the waste of waters but a few hedge-tops, or here and there a tree, with sometimes a solitary farmhouse standing on an island knoll. All round Welshpool, Montgomery, Llanidloes, and Machynlleth there is the same watery monotony—roads impassable, villages isolated, towns flooded. At Oswestry one of the chief streets is rendered almost impassable. In fact, taking the River Thames as a boundary, nearly the whole of England north of that river is at this moment suffering from very unusual, though not, perhaps, altogether unexampled, floods.

The chief force of Monday night's hurricane seems to have spent itself on a still more northerly district. There was a heavy sea at Dover and Ramsgate, but Grimsby was, perhaps, the most southerly point at which we hear of the hurricane. Monday night was windy in London; but in Staffordshire the wind was a strong gale; in North Derbyshire it was a tremendous gale; and all along the Eastern coast the wind rose to a fearful hurricane, the centre of which seems to have gone right across Yorkshire and Lancashire. At Grimsby the telegraph poles were blown down, as they were for a long distance along the line of the Great Northern Railway, near Doncaster, and in most parts of the two great manufacturing counties. At Oldham, Burnley, Chorley, Blackburn, Lancaster, and Preston, great damage was done, and houses in course of erection were blown down. At Hartlepool the storm was as furious as at Grimsby, and farther north, at Shields, and from thence up to the Border and along the Scottish coast, it was exceptionally violent. Everywhere the wind brought with it a vast downfall. On Tuesday the streets of Leeds were almost stopped with melting snow. At Burnley, in Lancashire, at Chapel-en-le-Frith, in Derbyshire, the snow is spoken of as many feet in depth. All round Grimsby the the lowlands are flooded for miles. In fact, at this moment there seems to be scarcely a river in England which is not flooded to a disastrous extent. Nor is our experience, or even that of our Parisian neighbours, exceptional. All along the western part of the Continent the same thing is taking place. Denmark has been deluged, and so much suffering inflicted that a Central Relief Committee is sitting at Copenhagen. At Ghent two thousand beds were made up in the Town Hall for washed-out people on Sunday night, and the Belgian papers are full of accounts of the suffering and inconvenience caused by the floods. From Switzerland we hear that the Alpine passes are in a frightfully dangerous state owing to the rains; and that the populations of the higher valleys have to be on the watch night and day.

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SCHOOLS OF ART.

NEWCASTLE.—The nineteenth annual meeting of the Newcastle-under-Lyme School Board was held on Tuesday evening in the Town Hall. The committee reported a decided improvement in the attendance of students, a satisfactory progress in their work, and some augmentation of income. The income was not, however, sufficient to enable them to offer local prizes on the scale they wished, for they were strongly impressed with the increasing necessity for encouraging and fostering the study of science and art among the artisans of this country; and in no district was there a greater need for study than in North Staffordshire, where pottery, mining, and engineering operations were so extensively carried on. The committee announced that classes had been formed for the study of chemistry and mathematics, and strongly commended these, as well as the other classes, to the thoughtful consideration of the young people of the town. They referred with regret to the retirement of Mr. Earl from the office of secretary, and gratefully acknowledged his long and valuable services to the school. Mr. Bacon, the master of the the school, reported that 64 students had attended the school during the year, and 35 were examined at the annual examination in April, when 15 succeeded in one or more papers, 5 obtained prizes, and 1 student obtained a second-grade certificate. At the examination of the works in London, 6 third-grade prizes were awarded, and 4 free studentships to 4 of the most advanced students were also awarded, the Science and Art Department paying the fees of these students for twelve months. Six second-grade prizes were also obtained by the school. Messrs. Ainsworth & Brade, the teachers of the chemical class, reported that 22 students attended the May examination, and 11 obtained prizes, besides 3 commended. These included 4 Queen's prizes and 7 certificates. The statement of accounts showed receipts for the year amounting to £160 19s. 3d., and after payment of expenses, there remained a balance in hand of 10d.

MANCHESTER.—The annual distribution of prizes to the students of the Manchester School of Art took place on Wednesday. From the treasurer's report it appeared that the income during the year had amounted to £1,365, and the expenditure to £1,360. The balance owing last year (£139) had been reduced to £135. The committee's report stated that the attendance at the public and private classes had been greater than previously, and the receipts therefrom had consequently increased. The income from subscriptions had fallen off slightly. The committee trusted that steps would be taken so as to relieve the school from debt. Mr. W. J. Muckley, the head master, read his report, which stated that during the past twelve months his work had increased considerably, not so much in his intercourse with the students who now attended the school, as with a large number who had left it from time to time, and who were still desirous of obtaining information to guide them in their daily doings; and also with applications from individuals who had no communication with the school at all, but who were anxious to have his advice on various points in relation to art. During the year 1,276 persons had received instruction through the agency of the school, and out of that number 366 had attended the School of Art, and arrangements had been made for any public school within a short radius of Manchester receiving instructions in drawing. 1,218 works were forwarded to London for competition in April. The award of prizes from the Science and Art Department had been two gold medals, one silver medal, three bronze medals, four book prizes, 14 third-grade prizes, and 25 second-grade prizes. Seventy students were successful in passing one or more exercises at the annual examination. That school had never before secured two gold medals in one year, and only ten had been distributed throughout the art schools of the United Kingdom. It was now very evident that the middle classes were beginning to be more and more anxious respecting the course they ought to take to obtain that knowledge of art which would either contribute to their interest in their respective occupations or furnish a more rational employment for leisure hours than this pursuit had hitherto done. The out-growth of the efforts made in so many ways during the last 20 years would now be recognised. At the exhibition of works held early in the year in that building, in connection with the Manchester Academy, 118 were the productions of old students of the school, all of which were very meritorious; and on the walls of the present exhibition-rooms might be seen many more of an excellent character executed by painters who had been recently students of that school. He mentioned this, as it pointed unmistakably to the influence of the school in that department alone.

S. MARTIN'S-IN-THE-FIELDS.—Lord Lyttelton, on Thursday week, distributed the prizes awarded by the Government Department of Science and Art to students at S. Martin's School of Art, Castle-street, Longacre. Mr. G. D. Leslie, A.R.A., delivered an interesting address on art, especially pointing out to the students the difficulties they must prepare themselves to overcome if they were ambitious to become artists. Mr. Marks, A.R.A., also warned the students that they would have to work hard to come up to the present standard of art, which was infinitely higher than when Mr. Leslie and he were students. If it would afford any consolation to those who had not gained prizes he did not mind confessing that he himself had never gained a prize in his life but once, and that must have been by an oversight, for it was for Latin and not for art. Mr. Parker, the master of the school, in acknowledging a vote of thanks tendered to him by the students, showed what progress had been made in the school. Last year there were 106 students, who sent up 554 works for examination; this year there were 117 students, and they had sent up 995 works. Last year in the national competition the school gained a gold and a bronze medal and two book prizes; this year they gained a bronze medal and four book prizes; last year five free studentships were won by the school; eight had been awarded to them this year. Mr. Palmer proposed, and Mr. Watkiss Lloyd seconded, a vote of thanks to Lord Lyttelton.

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CHIPS.

Mr. C. H. Heathcote (of whose paper read at the Institute on Monday evening we elsewhere give an abstract) purposes, in the ensuing year, with the aid of his friend, Mr. Sington, to publish a work on the "Antiquities of Manchester and Neighbourhood," giving full and numerous etchings of such as are in good preservation, and plans, &c., showing the restoration of those now in ruins.

A memorial window has just been put in the chancel of the parish church at Standon, Herts, by the Rev. D. D. Sadleir, whose family grave is at the south side of the chancel, the subject being the stoning of St. Stephen, and is by Ward & Hughes, of London.

A serious fire occurred in S. Andrew's Church, Southport, on Sunday night. Before the flames were extinguished the organ was destroyed, and a portion of the stonework surrounding the organ chamber much damaged. The loss is estimated at between £1,000 and £1,500. It is supposed that the fire originated from the overheating of the warming apparatus.

Mr. C. L. Gruneisen has resigned the secretaryship of the Conservative Land Society, after holding the position for twenty years.

The Managing Committee of the Dover School of Art have determined to establish a new school, and have invited tenders for the erection of the building.

A new Wesleyan chapel for the village of Little Chesterford, on the main road from Saffron Walden to Cambridge, has been opened. It seats 120 persons, and has been built by Mr. Thomas Hagger, of Great Chesterford, from drawings furnished by Mr. W. Ranger, architect, of London and Lewes.

EDINBURGH.—A monumental cross has recently been erected in Warriston Cemetery deserving of notice. It is to the memory Mr. Robert M'Lean, a native of Coll, late of Canterbury, New Zealand, and the work has been executed by Messrs. M'Glashan & Sons. The cross, which is of fine Binny freestone, is 19ft. 6in. in height, and stands on a pedestal of 6½ft. high—the total height being thus 26ft., and the weight of the stones about 18 tons. Both faces of the monument, as well as the edges, are enriched with ornamental patterns and bosses of the Celtic type.

Building Intelligence.

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CHURCHES AND CHAPELS.

Challock.—The new church of All Saints, Challock, Newton Stewart, N.B., was consecrated on the 28th ult. The church comprises nave and chancel, wood porch on stone base, and gabled organ chamber and sacristy. The style is Early Decorated, and the church is built of blue limestone, with white freestone dressings, and lined throughout with Bath ashlar. The east and west windows are three-light, with plate tracery, and the others are single lights with trefoil heads. The roofs are all of wrought and moulded wood, that in the nave being plastered between the rafters; this plastering will be tinted sky-blue and spangled with golden stars. The chancel roof is waggon-headed, with richly-moulded ribs of bold carved bosses at intersections. The chancel is raised above the nave, and is separated therefrom by a wrought-iron screen by Hart, Son, Peard & Co. The windows are filled with tinted cathedral glass, the east window and three others being stained by Gibbs & Co., of Marylebone-road. The architects are Messrs. W. G. Habershon & Pite, of London. Mr. Park was clerk of the works, and the builders were Messrs. Murray, of Newton Stewart, and Annandale, of Edinburgh. The pulpit, font, and wood screen are by Cox & Sons.

Cheetham. — Victoria Wesleyan Chapel, Queen's-road, Cheetham, was opened on the 6th inst. The style is Gothic, of an early period. The Building Committee applied to several architects, who submitted designs, and they selected that furnished by Messrs. Clegg & Knowles, of Manchester, under whose direction the work has been executed. The chapel only has been built at present, but it is contemplated, as soon as funds will permit, to erect, in addition, a vestry, lecture-hall, three class-rooms, and chapel-keeper's house. The inside dimensions of the chapel are 76ft. by 47ft., exclusive of the organ-gallery and vestibule, which make the total length 104ft. The spire rises to a height of 168ft. Three doors at the west end open into the vestibule. Sittings are provided on the ground floor for 490 persons, and in the galleries for 338, making a total accommodation for 828. Pitch pine has been used for the fittings. The contract for the building has been carried out by Mr. M. Foggett, builder, of Elizabeth-street, at a cost of £5,100.

Exeter.—The restoration of the choir of Exeter Cathedral is approaching completion, and the stalls, now being executed by Messrs. Farmer & Brindley will shortley be erected. The reredos, too, made by the same firm, is nearly ready, and the erection of it will commence with the new year. The background is composed of Devon and Cornish marbles, and it will exhibit three distinct groups of statuary, with figures 3ft. in height. It is wished to leave a space over it through which a glimpse can be obtained into the Lady Chapel. The designs for the paintings which are to be placed in the nine compartments of the Lady Chapel reredos have been decided upon, and approved by Sir Gilbert Scott, and Messrs. Clayton & Bell have been entrusted with their execution. The restoration of the transepts and the space where the altar now stands, in front of the screen, together with the reserved seat space adjoining, will be proceeded with simultaneously with the completion of the choir, so that all that portion of the building will be available for congregational purposes when services are recommenced in the choir.

Hedon. — The nave and aisle of Hedon parish church, which for some time past has been undergoing restoration, being completed, was opened to the public on the 5th inst. In July, 1869, the restoration of the south transept was completed, the south front being entirely rebuilt, and a fine open roof replacing the unsightly one of old, Mr. Street supplying the plans, and the work being carried out by Messrs. Shafto & Barry, of York. The western portion, now completed, consists of a nave and aisles 85ft. long and 48ft. wide, and is in the Decorated style of architecture. The unsightly plaster ceiling has been removed, together with the flat-scheme arched roof, and a framed open-timbered roof substituted, to the original height; also new roofs to the aisles, with moulded timbers, boarded and covered with lead. The unsightly brick battlements and parapets have been taken down and reinstated in stone; new gables and crocketted tops to the buttresses, with carved finials carefully copied from existing details. The west gable is entirely new, with pinnacles, coping, and cross at the apex, there being no vestige of the old one remaining. The works have been carried out from the designs and under the superintendence of Mr. J. T. Webster, architect, of Hedon. Mr. Charles Atkinson, of Roos, was the contractor for the various works, the woodwork being executed by him. The stone work and carving, the principal features of the work, were entrusted to the Messrs. Wilson Brothers, of Hull.

Hull.—On Thursday week the foundation stone of the Latimer Congregational Church was laid. This church is to be erected in an Early style of Gothic architecture. The materials for the construction of the exterior are red stock bricks, black bricks being introduced in the bands and arches. The stone work to the windows and doors throughout is in Idle stone. The church is approached by three entrances leading into a spacious vestibule, and consists of nave 34ft. in width, and 66ft. in length, and has transepts 23ft. 6in. in width, and 10ft. in depth, affording accommodation on the ground floor for 454 persons. There is a front gallery, which is approached by a staircase in the tower, having additional accommodation for 88 persons. The roof is to be open-timbered, having framed trusses and curved ribs, and will be plastered on the underside of the rafters. The seats are to be of red deal, having cut ends and panelled framing. All the woodwork exposed to view is to be lightly stained and varnished. The building is to be lighted in the front by a three-light central window, and two side lights over the gallery; the nave with six two-light windows, and each transept by five single lights, and large rose-window in gab le. The square portion of the tower is carried to a height of 54ft., and is surmounted by an octagonal spire, which is slated in bands of blue and green, reaching a total height of 92ft. to the top of vane. The architect is Mr. Samuel Musgrave, A.R.I.B.A., of Hull.

Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels.—The usual monthly meeting of this society was held on Monday at the Society's house, 7, Whitehall. Grants of money were made in aid of the following objects—viz., building new churches at Borth Cardigan; Mitcham, Christ Church, Surrey; and Willington, near Newcastle-on-Tyne. Rebuilding the churches at Guildford, S. Nicholas, Surrey; Murston, near Sittingbourne, Kent; and Welland, near Upton-on-Severn, Worcester. Enlarging or otherwise increasing the accommodation in the churches at Bisley, near Bagshot, Surrey; Baxterley, near Atherstone, Warwick; South Cockerington, near Louth, Lincoln; Eaton Hastings, near Lechlade, Berks; Great Horwood, near Winslow, Berks; Kennington, S. Mark's, Surrey'; Llandrygarn, Anglesey; Rushden, near Higham Ferrers; Trimdon, near Ferry-hill, Durham; and Whitchurch, near Haverfordwest. Under urgent circumstances, the grant formerly made towards reseating and restoring the church at Grosmont, near Hereford, was increased. Grants were also made from the School-church and Mission-house Fund towards building school or mission churches at Shooter's-hill, All Saints, Kent; Staleybridge, Christ Church, Lancashire; Wolverhampton, S. Mary; Preston, near Tynemouth; and Cwm-ysgwydd-gwyn, near Gelligaer, Glamorgan.

Kirkby Fleetham.—A new chancel has been added to the ancient church of S. Mary, Kirkby Fleetham, at a cost of £2,100. The style of the chancel is Early English. The reredos is formed of Aberdeen granite and Caen stone. In the centre niche is a cross of Italian alabaster, and the other six niches are filled in with mosaics. The reading desk and choir stalls are of oak. The screen is of oak, decorated; and the pulpit is also of oak, octagonal in shape, and neatly carved. The parapets of the nave and north and south aisles have been entirely rebuilt. The main portion of the north wall has also been rebuilt, and partly new roofed. The porch remains in *statu quo.* The Early English Decorated doorway, and all the windows on the south side have been altered and restored in the Decorated style. The tower is in the Perpendicular style, and the tower arch and windows are restored. Mr. Henry Woodyer, of Graffham, near Guildford, Surrey, was the architect, and Mr. W. Dennison, of York, the sole contractor.

Oxford.—Messrs. Symms, builders, have already demolished the old tower of S. Aldate's Church, with a view of erecting a new tower and spire of handsome appearance and dimensions, which will be in character with the remainder of the church, from designs by Mr. Christopher, architect, of London. —The prominent and beautiful spire of All Saints' Church having been pronounced to be in a very dangerous condition, it has been resolved to take it down and rebuild it. The work has been entrusted to Mr. E. G. Bruton, architect, whose designs provide for the rebuilding of about 37ft. of the spire, which is already commenced.

Portesham.—The parish church of Portesham, Dorset, was reopened on the 28th ult., after having been closed for about six months for restoration. The building was in a very dilapidated state before restoration. It has been reseated throughout with open benches of deal, stained and varnished. The old whitewash has been removed, the walls restuccoed, and the stone arches and columns restored. The old carved pulpit has been repaired and placed on a suitable pedestal, and the ancient oak screen has also been repaired. The altar and chancel floors have been laid with Minton & Co.'s tessellated paving, and a stained glass window has been placed in the chancel. The old flat ceiling of the chancel has been removed and replaced with a coved ceiling with ribs and bosses. The old and unsightly gallery has been entirely removed. In carrying out the work some fine specimens of fresco paintings were discovered on the walls; these were photographed. The work has been carried out, at a cost of about £2,000, by Mr. Stevens, builder, of Southampton, the architect being Mr. G. J. G. Gregory, of Dorchester.

Salford.—On Saturday the (Roman) Catholic Bishop of Salford laid the foundation stone of the new church of S. Peter, in Greengate, Salford. The new building will be 100ft. in length, by 52ft. in width. The design is by Mr. Welby Pugin, and the style is that of the early part of the fourteenth century.

York Minster.—Mr. G. E. Street has paid a visit to York Minster for the purpose of inspecting all that has been done in the way of renovation. During the past week the masons commenced rebuilding the second half of the clerestory wall in the east side of the transept. In taking down the wall it was found to have been built in anything but a substantial manner. Inside the wall there had been filled in loose materials without any cement, and the strength of the wall was consequently impaired. The same remark applies to the west wall. A different mode is being adopted in the rebuilding of these walls. They will be of solid masonry, laid in with Portland cement. A few days ago the cleansing of the east wall of the transept was commenced, and in removing the plaster from the vaulting, traces of colouring of a chocolate hue were discovered, leading to the supposition that a substance of this colour had been originally used for decorative purposes. The roof on each side has been boarded, and almost entirely covered with lead.

BUILDINGS.

Glasgow.—New premises for the British Linen Company's Bank, at the corner of Eglinton and Norfolk streets, have been erected from a design by Messrs. Salmon, Son, & Ritchie, architects. This pile of building, which has cost nearly £10,000, is of a very imposing character, the style being an adaptation of Italian Gothic. The banking office is situated at the corner, and consists of telling-room, agent's-room, safe, retiring-room, &c. The entrance is by a doorway placed at the angle, having a three-quarter column with foliated capital on either side, bearing a pointed arch, within the segment of which is sculptured the figure of Minerva. The timber finishings are all stained and varnished.

Newington. — The new Elephant and Castle Theatre is fast approaching completion, and, according to present arrangments, will be opened on Boxing-night. In addition to the principal entrance in the New Kent-road, there will be two entrances for pit and gallery in the Walworth-road, and another from the Station-road, adjoining the Elephant and Castle Station of the London, Chatham and Dover Railway. The auditorium is arranged as follows: Pit, 1,500 seats; stalls, 250; gallery, 800; boxes, 500. There will also be twelve private boxes, and a promenade and standing room for 1,000 persons. Messrs. Dean, Son, & Matthams, of Mark-lane, are the architects, and Mr. Giles Bennett the builder.

Preston.—New premises for the *Preston Guardian* offices are approaching completion. The architect, Mr. T. H. Myres, of Preston, has adopted the Italian style, freely treating it to meet the requirements of the building, which comprises publishing and printing offices, editors' and reporters' rooms, machine rooms, &c. The stone used in the frontage is from the Longridge Quarries, "boasted" or tooled throughout. The whole of the works have been carried out under separate contracts, and under the supervision of the architect, Mr. B. E. Entwistle acting as clerk of the works.

York.—A new Volunteer Drill Hall has been opened in York. The plans and drawings were prepared by Messrs. Gould & Fisher, of that city, architects. The length of the building is 96ft. and its breadth 60ft. and the height from the floor to the apex of the roof is 40ft. At the west end of the hall is an orchestra, beyond which, on the ground floor, is an armoury, and a practice room above for the band, which will also be used as a reading room.

The cost of the site and the old buildings thereon was £1,700, and the outlay on the new structure £2,000, making a total expenditure of £3,700.

SCHOOLS

Brentwood.—The memorial stone of the Brentwood New-road Congregational Schools was laid on Wednesday, the 17th inst. The new buildings will comprise a school-room 47ft. by 28ft. with three-class-rooms about 10ft. square; an infant school 22ft. by 12ft. and kitchen and other offices. The school-room is approached by two recessed porches, and is lighted by four bold arched windows. The roof, which is partlly open, is divided into five bays, with triple gablets towards the road. The building is being carried up in yellow stocks with red pointed arches, strings, &c. The roofs are to be covered with slates. Messrs Winter & Son, of Brentwood, are the contractors, and Mr. Charles Pertwee, of Chelmsford, is the architect.

Standon, Herts.—New schools have been opened here, two-thirds of the outlay being raised by subscriptions and a grant, the remainder by a voluntary rate. They comprise a new school for girls, 42ft. by 18ft., with lobby 12ft. by 10ft., built of red brick, with moulded string-courses, and pointed with black. The boys' and infants' schools, with residence for master and mistress, have been remodelled; this building is half timbered and overhanging at back, supposed to have been built by the Knight Templars; it is 105ft. in length, and was covered with lath and plaster. In clearing it, the timbers were found to be good old oak, and they have been cleaned and oiled, and filled in with red brick, black pointed. The boys' school is 34ft. by 17ft., with lobby 17ft. by 13ft. The infants' room is 27ft. by 17ft. There are good playgrounds for each school, being separate. The works have been carried out by Whitaker & Sons, of Standon; Mr. G. E. Pritchett, of Bishops' Stortford, being the architect, Mr. Warner, of Stortford, supplying the school desks, &c.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half yearly volumes, 2s. each.

NOTICE.

It is intended to issue in future, in the First Week of Each Quarter, a "Large Number" of the Building News, with a guaranteed circulation of

Twenty Thousand Copies.

Copies of these numbers will be forwarded to every Architect, Engineer, Builder, Contractor, and Surveyor in the United Kingdom, and to all in America, India, and the Colonies whose addresses can be obtained.

Space will be reserved for a limited number of Extra Advertisements, the charge for which will be as follows

Whole Page........	£12 0 0	Quarter Page	£4 0 0
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Small Advertisements One Shilling per line.

Special arrangements may be made for a series of insertions.

The First Quarterly Large Number will be issued on January 3; 1873, and all advertisements intended for insertion therein should at once be forwarded.

Received.—J. N. L.—J. A. W.—W. G.—G. A.—T. S.—J. P. S.—E. M.—E. W. G.—W. J. H.—Archdeacon B.—H. O. W.—E. R. C.—W. H. & Co.—J. P.—T. G.—R. & N.—G. A. W.

Another Protestant and Architect.—We wanted the address to forward a private letter.

A. M. Dunn.—The drawings returned.

An Architect.—Inadmissible, because illegal. In wishing us to insert a letter which would subject us to an action for libel you might at least have given your name and address.

Building News School Planning Competition.—We shall not be able, as we expected, to exhibit the competitive designs at the Architectural Association rooms,

Correspondence.

DISEASE, VENTILATION, AND ARCHITECTURE.*

Sir,—In Dr. Black's interesting paper (see page 488) on "The Relative Frequency of Disease Between the Right and Left Sides of the Heart," the following passage occurs, "Architecture has much to undo, much to learn before it can satisfy the simple laws of nature. In ignorance of these laws houses are built, stately edifices erected, and no thought or care is taken to render the air within as pure as the air without. It is nevertheless easy to accomplish this desideratum, but blind unyielding ignorance chains death in every room."

No greater benefit could be conferred on mankind than the teaching them the necessity of ventilation, but that lesson is more likely to be learnt if it comes from the doctor than from the architect.

I think Dr. Black rather underrates the difficulty. When there is both lighted gas and a fire it is easy. A hot chamber-stove supplied by fresh air from without will give a sufficiency of warm fresh air, and one of Rickett's ventilating gas-burners will remove the carbonised air; but to apply this to a single room will cost from £30 to £50, and few persons are willing to incur this expense. In addition to this, when there is only a fire without gas burning, the cold air is apt to come down from the ventilating tube of the gas-burner.

In houses already built, where gas is not burnt, it is difficult to get rid of the carbonised air; the smoke that comes through Arnott's valves so blackens the walls and ceilings that the valves are not unfrequently removed; and in bedrooms where there is neither fire nor gas simple ventilation by means of gauze or finely perforated zinc is generally pasted up. To supply the whole house with warmed air and to remove the carbonised air requires a more or less costly apparatus, which is generally objected to on the score of expense, and which is still more costly and troublesome to execute if required for a house already built. When an architect proposes any system of warming and ventilation the reply usually is that the owner "is perfectly satisfied with an ordinary open fireplace and sash windows, and that he does not see the necessity of going to the expense of other means of ventilation, which he understands do not generally answer."

Severe colds in the head and an increased outlay are tangible evils, while the gradual deterioration of health by living in ill-ventilated rooms is looked upon as a visitation of God.

It must not be forgotten that hitherto ventilation has been usually a failure; the costly mistake of the House of Commons is one grand stand-point of objection.

In the first quarter of this century the subject of ventilation attracted much attention, but the practical promoters were so incapable of applying it satisfactorily that people became disgusted with the expensive failure, and as no serious injury was known to be caused by the want of ventilation, all attempts to secure it were abandoned. Architects can only be supposed to know the immediate inconvenience of the want of ventilation, and not its ultimate effects on the human frame.

If my recollection serves me, in a paper on railway travelling in the *Lancet*, we were informed that greater evils resulted from persons catching cold (by having the windows of railway carriages open) than by the diminished circulation caused by the carriage being unventilated.

A very large room in the City of London that was built about the year 1828, was put into the hands of Dr. Arnott to warm and ventilate. On his failure the schemes of Walker, Perkins, and others were tried, and all without the smallest success; the constant complaints of the clerks who were annoyed by the hot air, and of those who got colds and rheumatism in the head from the cold air coming in where the hot air ought to have gone out so annoyed the secretary that at last the ventilators were blocked up, and the clerks who complained of cold were supplied with hot water tins for their feet.

I have seen dozens of cases in bedrooms where the perforated zinc or gauze was blocked or pasted up, which had originally admitted fresh air. My last experience of drainage and ventilation as applied to a stable may be instructive. An old stable was altered, light was admitted at the dark end by a large shaft, the soaked soil was removed, the whole stable concreted, the floor paved with adamantine clinkers, the stable drainage carried on the surface to the outside, the warming was obtained by means of hot-water pipes in the coach-house communicating with the stable, the ventilation by means of one fixed open louvre at the top of the light shaft, by a perforated zinc tube over the mangers leading at both ends to the open air, and by an impervious pipe also open to the air at both ends, supplying air to perforated plates under the mangers. The stable was no sooner occupied than the surface drains were removed, and the stalls drained by horse pots into the general soil drain, and directly the cold weather set in, the fact of one horse having a cold was sufficient to cause the owner to have the ventilator in the light shaft permanently closed, and both ends of the other ventilating pipes blocked up.

Until the faculty can convince people that their life is shortened, and serious diseases brought on by want of ventilation, architects have no chance.—I am, &c. George Aitchison, F.R.I.B.A.

5, Muscovy-court, Trinity-square, E.C.

THE ARCHITECTURAL ASSOCIATION.

Sir,—Will you permit me to call attention to certain modifications that have been made by the Committee of the Architectural Association to enable those students who are resident in the country, and have not the advantages of a local society, to avail themselves of the library, classes, and prizes of the Association, full particulars of which may be obtained from the honorary secretaries.

I trust that the experiment may prove successful for those for whom it is intended, and that the result this session will encourage the Committee to carry on this extension of the work of the Association.—I am, &c., J. Douglass Mathews, President.

9, Conduit-street, W., Dec. 18.

VILLA AT BROUGH, EAST YORKSHIRE.

Sir,—Is there not a remarkable satire upon the stability of concrete as a building material, in the description of this singular looking villa, published in your impression of the 6th inst. I find the parts of the building most exposed to the weather, wear, &c., such as the "chimneys and tower," are "coped with stone," and the steps and copings generally are of Bradford stone. Is this gilding refined gold, or does it mean that concrete in such situations is not to be trusted? Argus.

"BUILDING NEWS" COMPETITION.

Sir,—Being a constant reader of your paper, and having much pleasure in stating that from its pages I have gained a very large amount of instruction of great use to me professionally, I venture now to offer some suggestions relative to your proposed competition. I gladly second the request in a letter you published last week that the next competition be for a design for a town church, but at the same time would ask you whether such an arrangement as I beg to lay before you here could be adopted, if not entirely, perhaps in part, my idea being that what I propose would tend to promote amongst us a habit of careful drawing and of thinking out, in detail, the construction and fitness of the building we design. I beg, therefore, to suggest that the subject be a church or chapel, for a town, with accommodation for seating from 600 to 1,000 persons; that each design be made to suit the requirements of some one denomination, and that such be stated upon the drawings; that each design be accompanied by an outline specification and a statement of probable cost, with the manner of arriving at such, whether by approximation or estimate upon quantities, and whether framed by London or other local prices; that each set of drawings comprise ground plan, plan of foundations, ditto of roof, elevations of each side and end, two sections, perspective view of outside, ditto of inside, showing position of pulpit, and one sheet of details to scales of ½in. for stone and 1in. for wood, showing the principal parts of construction. Also, that each set of finished drawings be accompanied by a duplicate set drawn to a small scale upon lithographic transfer paper, that the same may be printed in the Building News, and that each competitor subscribe some small sum (to be settled by you) in order that the whole may be published, that we may study and criticise, and be benefitted by each other's work.—I am, &c., J. P.

Sir,—Your competitions seem to be quite popular, and will no doubt do much good from the fact of their being so much wider spread than those of Associations. I would ask you, however, to insist especially on detail. A good motto would be "Detail! Detail!! Detail!!!" Young men neglect it frightfully, and their elders are very rarely their betters in this respect.—I am, &c., E.

Sir,—I have read the suggestions offered by your correspondents in reference to the proposed Building News Competitions, and it appears to me that the next best subject for a competition would be a second block of school buildings for a larger number of children, say 1,200; and where the competitors will not be confined to a small piece of land as in the last case, but where there will be freer scope for the recreative wants of the children. But whatever subject may be decided upon, I think it highly necessary that a plan of the ground and surroundings should be given, as otherwise we are not so likely to obtain that originality and thought which is so desirable in this class of competitions. W. R. W.

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* From the *Lancet*.

Intercommunication.

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QUESTIONS.

[2728.]—**Plaster Casts.**—1. Can any reader inform me of the best way to remove the ridges on casts formed by the junction of mould pieces? 2. How to clean off dirt accumulated by handling and dust?—W. L

[2729.]—**Villa by J. K. James.**—In looking over your illustration of a villa by J. King James, Esq. (in your issue of the 6th inst.) it appears to me that the fireplaces of bedrooms in chamber floor plan over butler's pantry are placed over voids. Would you kindly explain in a future number how this is accomplished, for the benefit of your young readers?—An Apprentice Architect.

[2730.]—**Heating.**—Will some brother reader inform me what area of window glass is usually allowed in calculation for a superficial foot of hot-water pipe, or (say) for a foot run of 2in., 2½in., 3in., or 4in. pipe? I find several formulæ for heating purposes, based on the cubic contents of the room to be heated, but none take into consideration the glass in windows, which is, I presume, so much cooling surface. Are there any really good works published on the subject? If so, I should feel obliged for information thereon.—Inquirer.

[2731.]—**Best Work on Cemetery Memorials.**—Will some subscriber kindly mention some of the best works on cemetery memorials?—Anon.

[2732.]—**Ornamental Brickwork.**—I shall feel obliged if some of your contributors will kindly inform me whether there is any illustrated work on the above subject?—Building Contractor.

REPLIES.

[2700.]—**Surveying.**—"C. W. F." will find the following the simplest method of ascertaining the area of a triangle where the three sides are given: From half the sum of the three sides take each side separately. Multiply the half sum and the three remainders together, and the square root of the product will be the area. Taking the instance given where the sides of a triangle are respectively 236, 250, and 236 links, the result will be 1r. 0·0354p. By the following method the perpendicular and area are both obtained: Divide the difference between the squares of two sides of the triangle by the third side; to half this third side add half the quotient, and deduct the square of this sum from the square of the greater side; the remainder will be the square of the perpendicular, the square root of which, multiplied by half the base, will give the area of the triangle.—W. R. W.

[2700.]—**Surveying.**—I am obliged to "T. H. E." for correcting the error in my reply to "C. W. F.," and I regret that it should have occurred. It was occasioned through a calculation being hastily made on some triangles enclosed within a semicircle, whose chord formed the base of the triangles. These would, of course, be right-angled triangles, and to such alone will the proportions stated hold good.—Karl.

[2724.]—**Sketching Mouldings.**—Your correspondent "S. S. H." will find the cymagraph, invented some years since by Professor Willis (Jacksonian Professor at the Cambridge University) answer his purpose for sketching mouldings much better than copper wire. I have used it to copy undercut mouldings most successfully.—John L. Pate.

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WATER SUPPLY AND SANITARY MATTERS.

New Water Supply for North London.—The *Harrow Gazette* states that nearly twenty years ago a company was formed for giving London a new source of water supply, derived from Bushy, near Watford, where wells were to be sunk, but the project was defeated in Parliament through the influence of the New River Company. The scheme has now been revived under more modest limits, under the name of the Colne Valley Waterworks, to supply Harrow Weald, Stanmore, Edgware, Hendon, Kingsbury, and Willesden, Aldenham, Elstree, and other places with water.

Sheffield.—At a special meeting of the Sheffield Town Council on Wednesday week, it was resolved, by forty-six to four, to proceed with the Parliamentary Bill for the purchase of the waterworks by the Corporation. It is estimated that there will be a loss at first which will require a rate of 6d. in the pound for eight years, but that after that period a profit would begin to accrue. The Council further decided to oppose the water company's bill.

Dublin.—An influential meeting has been held, presided over by Lord Talbot de Malahide, in opposition to the Dublin Sewage and Land Reclamation Scheme. Resolutions condemning the scheme were passed with great unanimity. It is contended that the plan proposed of embanking and drying up the estuaries of Baldoyle, Malahide, and Rogerstown will, if permitted to be carried out, inevitably result in the filling up and closing of those ports, by the silting up of the sand on the bars when the scour caused by the ebb and flow of such large bodies of water is done away with,

Our Office Table.

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The Late Mr. Banks.—Mr. Banks, of the firm of Banks & Barry, of 1, Westminster-Chambers Victoria-street, died on Saturday last. Mr. Banks was held in high esteem, and bore an excellent professional reputation. The news of his death reached us too late to give any details of his life.

Reading Architectural and Archæological Society.—The opening meeting of the season was held on Wednesday evening, the 4th inst., at the Athenæum. An address was delivered by the newly-elected President, Mr. Joseph Morris, after which a paper was read by Mr. C. Holmes upon ", Mechanical Appliances Considered as Building Improvements." Captain Kennedy and Mr. Clapton C. Rolfe have been elected members of the society.

Mr. Ruskin's Art Lectures.—Mr. Ruskin delivered, at the Taylor Institute, Oxford, on Thursday week, a supplementary lecture on Sancho Botticelli. He pointed out, as the commonest error of modern times, the idea that art is simply a collection of colours and design, and that it could not be legitimately didactic. Such an idea was totally and radically false. The highest art had always been didactic. The great masters, Holbein and Botticelli, obtained their great fame as reformers and theologians; they worked with and for Savonarola and Luther. The English are terribly deficient in art criticism. Botticelli was born in 1457, and resolutely refused to learn to read or write—a thing which the lecturer wished other little boys and girls would do. He pointed out the artist's fondness for flowers; his roses are the most perfect art has represented. His lilies, too, are lovely. He drew a comparison between Bewick and Botticelli—illustrating it by comparing their ideas of the meaning of war. He also compared their relative ideas of wealth. Mr. Ruskin afterwards described his recent visit to the Gustave Doré Exhibition, which he called the abomination of desolation—a mass of devils, corruption, and death; no life, no motion, nothing but the vilest art and the vilest conception. After a long, bitter philippic against Doré, his admirers, and imitators, he closed the lecture by reading an address to his pupils, in which he told them that humility was one of the first rudiments of art, and that they must understand not only the technicalities of the great masters, but must have in them the spirit of that religion which called forth all the masterpieces of Mediæval art.

Railways for Western Australia.—Tenders have been invited for the execution of railway surveys in Western Australia, a sum of £1,675 having been placed upon the public estimates for the purpose. A survey is to be made of a proposed line 32 miles in length, between Geraldton and Northampton, in the Champion Bay district, as well as for another of 80 miles between Guildford and York; the general direction of the second line has been already determined upon. Western Australia has now existed for 43 years as a colony, and yet has not a single mile of railway in operation at present.

Arthur Speight & Sons (Limited).—Under this title it is proposed to form a company for the purchase and working of the business of Messrs. Arthur Speight & Sons, and also that of Mr. James Speight, the well known quarry-owners of Idle. The works consist of what are known as the Bolton Wood and Idle Moor quarries, both of which contain beds of stone of great thickness and extent. There are extensive wharves and sheds at Frizinghall, Leeds, and elsewhere. Besides the quarrying operations, the company proposes to embark largely in the construction of tramways and the laying down of wood and asphalte pavements.

Farnborough.—A new set of school buildings has just been erected at Farnborough, from the design of Messrs. George & Vaughan, the architects, of London. The large room is a mixed school for boys and girls, arrangements being made for separating it by a curtain; it measures 42ft. 6in. by 19ft. Attached is an infant school, 20ft. by 20ft. Accommodation is provided for about 150 children in all. A residence for the master forms part of the plan, and also a class-room and board-room. Separate playing-yards are provided for the boys and girls, and the earth-closet system is adopted throughout. A plain Mediæval character has been adopted for the elevation, coupled and triplet windows being variously introduced and grouped as required, with stone mullions and dressings of Gault bricks, manufactured to a particular splay for the jambs and reveals. Mr. Emmett, of Bromley, is the contractor. The cost will be about £1,500.

Trade News.

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Manchester.—The partial strike of the labourers employed in the erection of the new Town Hall, Albert-square, Manchester, is at an end. All the men, with very few exceptions, have returned to work, after being on strike for one day. Their demand of ½d. per hour advance in their wages was not acceded to, but ¼d. more per hour to skilled workmen was granted.

TENDERS.

Paddington.—For pulling down and rebuilding carriage factory at Paddington, for Mr. Wm. Miller. Mr Edward Monson, Jun., architect:—

Harris Brothers	£1155	0	0
Hatten	875	0	0
Sneezum	820	0	0
Parsons	725	0	0
Preedy & Son	698	0	0
Temple & Forster (accepted)	647	10	0

Penge.—For the erection of business premises at Penge, for Mr. F. Andrews. Quantities by Mr. Fleetwood:—

Brass	£1887
Carter & Son	1852
Scrivener & White	1794
Temple & Forster	1790
Downs & Co.	1786
Nightingale	1767
Tostevin	1747
Hughesdon (too late)	1675
Ockenden	1625
Boyce	1624
Archer (too late)	1582
Saul	1549

Poplar.—For the erection of a Danish Chapel in King-street, Poplar. Mr. John W. Morris, architect:—

Sheffield	£789
Abraham	769
Mark	758
Watts	750
Atherton & Latta (accepted)	725

Shepherd's Bush.—For road making and drainage works at Shepherd's Bush, for the British Land Company (Limited):—

Omes	£2850
Chamberlen Brothers	1614
Harris	1490
Bloomfield	1487
Haynes	1420
Jackson	1400
J. & S. Williams (accepted)	1300
Neave & Son (too late)	1290

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Ashton & Green, Slate, Iron and Marble Merchants, and Quarry Agents, keep the largest and best selected stock of BANGOR, PORTMADOC, and GREEN ROOFING SLATES. Slate Slabs, and every description of Slate Goods, Marble and Enamelled. Slate Chimney-pieces, Stove Ranges, Rain-water Goods and General Castings. A. & G.'s SPECIAL RED TILES prepared to use with the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices upon application.—Offices and Show-rooms 14 and 15, Bury-street, S. Mary Axe, London, E.C. Agents for London and Country for Sale of Whitland Abbey Green Slates.

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COMPETITIONS OPEN.

The Conference Committee on Competitions will be glad to receive, from provincial architects, the earliest possible notice of proposed competitions, in order that the committee may, in sufficient time, transmit to the promoters of such competitions, for their guidance, copies of the regulations, passed at the General Conference of 1872. Communications to be addressed to the Secretary of the Committee on Competitions, 9, Conduit-street, Hanover-square, W.

Carlisle Public Hall Company, January 15, 1873.—For plans for the proposed building.—Mr. C. Vynne, Hon. Sec., 1, English-street, Carlisle.

Chester Union, February 1, 1873.—For designs and estimates for a new workhouse to accommodate 500 male and female inmates, with the requisite offices, &c. Premium of £100 for the best, and £50 for the second best design.—Mr. William Keartland, Clerk to the Guardians, Chester.

Crowle (Lincolnshire), January 1, 1873.—For plans, accompanied by specifications and estimates, for school buildings to accommodate 175 boys, 175 girls, and 100 infants. A premium of £5 will be given for the best and most economical plan.—Mr. T. T. Pearson Clerk to the School Board, Crowle.

Llanelly School Board, January 1, 1873.—For plans of school buildings, for the accommodation of 800 children, at Brynmawr, in accordance with the provisions of the Elementary Education Act. The estimate not to exceed £3 per head. A premium of £15 will be paid for the plan approved of.—Messrs. Cox, Davies, & Browne, Solicitors, Market-chambers, Brynmawr.

The Carlisle Diocesan Church Extension Society, January 31, 1873.—For plans for a mountain chapel, suitable for 100 persons. Two prizes of twenty and fifteen guineas for the best designs. This competition is open to architects residing in Cumberland, Westmoreland, and Lancashire only.—Rev. Canon Shipman, Vicarage, Aspatria, Cumberland; and Rev. Canon Stock, Rectory, Windermere.

The Northampton School Board, January 27, 1873.—For designs for two new schools, with class-rooms and out-offices. One of the schools is to be built in Spring-lane, and is to accommodate 650 chil-

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 27, 1872.

MANCHESTER ARCHITECTS ON THE QUANTITIES QUESTION.

THE architectural world of London is from time to time made pretty well conversant with the sayings and the doings of the many archæological and architectural societies of the provincial cities, but it is by no means so very familiar with the transactions of provincial architects, by which we mean, not their occasional utterances as to the Battle of the Styles, the origin of the Gothic arch, or the true nomenclature of the Pointed styles, but what they say and do with regard to professional practices and customs, with which not they only, but every architect in the empire is specially concerned.

It will be remembered that, at the recent General Conference of Architects held in London, the architects of Manchester were by no means strongly represented. The fault lay, we presume, with the architects of that city, and not with the Conference and its promoters, and the circumstance loses none of its gravity from the fact that there exists in Manchester not a mere architectural society, but a Society of Architects, consisting of most of its leading professional men. We see on the list of the Council the names of the architects of the Manchester Cathedral, Royal Exchange, Art Treasures' Palace and Reform Club, and of some of its best churches and palatial warehouses. The annual Report of the society affords ample proof that, however sparsely its members might have attended the General Conference, they are, as a body, by no means disposed to shirk those vital professional questions that will from time to time assert themselves, and set clients, architects, and contractors, at loggerheads. It deals briefly, but boldly, and with no little wisdom, with the four vexed questions of architectural competition, professional charges, the employment of building surveyors, and building contracts, touching all which, we are glad to learn from the report, the Council of the society has been in very frequent communication with that of the Royal Institute of British Architects. How very little of this obviously important correspondence is known to the outside world of British architects! We cannot, like puissant members of our Lords or Commons, move for a copy of this very interesting correspondence: we can only congratulate ourselves on having at least got by mere accident a sight of the Manchester report, by which to form a pretty correct notion of the nature of these communications, destined, we are sorry to know, after mere docketing and shelving in the archives of the two societies,

> To waste their sweetness in the desert air.

We will say nothing for the present of the two important questions of architectural competition and professional charges; our object in just now calling attention to the Report is to acquaint our readers with the grave objections avowed by these Manchester architects to the lately-ventilated method of drawing up building contracts, and their incorporation with the surveyors' *quantities* on which the builders' tenders have been based. Manchester is not so insignificant a centre of architectural practice as to warrant our looking with absolute indifference on the wide divergence of opinion (between her architects and the advocates of this new system) that at present exists.

The Manchester Report classes together the two topics of the employment of building surveyors and building contracts, and observes: "Your Council found it impossible to send to the Committee, appointed by the Royal Institute of British Architects, a unanimous opinion of this society on the former of these subjects. The practice varies considerably, even in Manchester, among the limited number of our members, in dealing with quantities. Some—and it would no doubt decrease the anxiety and add to the independence of all could they see their way to adopting the same course—are in the habit of ignoring quantities and measuring up of extras and omissions altogether. But on the other hand it cannot be ignored either, that where deviations *do* occur, it is difficult to determine how an architect, in giving his final certificate, can safely do so on the statement of a surveyor, engaged it may be by the proprietor, or the architect, or the builder, without himself investigating that statement. The proprietor naturally looks to the architect to see himself fairly treated, and thus the choice of surveyor falls on either the architect or builder. To word a final certificate that, 'according to the statement made by Mr.—— [of whom the employer knows nothing] the sum of so much is due to the builder,' would naturally induce the client to ask the question, 'Can I rely on the accuracy of this statement?'"

There is no denying the cogency of this plain method of putting the case; and we must say that, in discussions of it that have yet come before the public, this prosaic view of the matter has not had very elaborate consideration. The surveyor may most likely be a very reliable man; but he may, as the Report assumes, be quite unknown to the architect's client; and another fact is certain, that he cannot, in the nature of things, know so much of the construction and details of the measured edifice as the architect himself, if he have duly served his client. In reference to this, the Report adds, truly enough:—"Thus it will be seen that, whether appointed by the architect or by the builder, the scrutinising of accounts, to a greater or lesser extent, *must* fall on the architect, who will be bound to see (where deviations from the contract *have* taken place) that a proper allowance has been made for items omitted, and none but a fair charge made for items added to the original contract,—an amount of labour that, in most cases cannot fairly fall under the head of 'examining and passing the accounts' [one of the duties of the architect included in the 5 per cent. charge], since the investigation of the measurements themselves might on occasions have to be gone into by the architect before he could give his final certificate. The nature and extent of this investigation, therefore, would seem worthy of being more clearly defined than in the above sentence. In further consideration of this question, your Committee had to deal with a 'Form of Contract, prepared by the London Builders' Society, on the base of headings sanctioned by the Royal Institute of British Architects,' which is a very lengthy document; and also with a request preferred by the Master Builders of Manchester, with a deputation from which body your Council have had an interview, that this form and that adopted by the Liverpool Society of Architects and Archæologists, should be acknowledged by the Manchester Architects. The most important clauses in these forms are—that the bills of quantities should be incorporated with the contract; and that if, on the conclusion of the works, there should be found any error in the bill of quantities, it should be rectified, and the difference be added to or deducted from the charge made by the contractor. Your Council cannot come to any other conclusion than that the adoption of any such principle must be fraught with serious risks to the proprietor, and absolute security to the builder. So long as estimates and contracts are based upon calculations made, *not* by the builder himself, but by a third party, it must be conceded that the party referred to is bound, in consideration of the payment he receives, to be responsible for the employment of proper skill and care; and that the cost of his want of knowledge or care should by no means fall on the proprietor, whose means may be limited, nor on the builder, who may be bound by his contract to supply what he may not have estimated for."

Very sensible are some of the conclusions given above. The Report does not end with them, but goes on with further excellent remarks, which we have not now space to quote. We are ourselves disposed to question the precise equity of the concluding paragraph of our long quotation. The society places the employer and the builder, in case of an error in quantities, in the self-same category. But this is hardly fair. If a builder incurs a deficit in his profit, by an error in quantities, his is a *bonâ-fide* loss, to the clear gain of the architect's employer, who thereby saves both the builder's material and labour and his architects 5 per cent. on the two. We see no very great hardship (though there may be temporary inconvenience, easy to abate), in his being made to disburse the money value of the omitted or under-measured items in the error. Altogether, we have been greatly pleased with the manliness and practical common sense manifest in this Report of the Manchester Society of Architects. We do not remember to have seen a more useful architectural manifesto. We recommend our readers to procure it, and carefully consider, not only this very serious question of contracts and quantities, but the excellent practical remarks it contains in reference to architectural competitions, professional charges, &c.

To return briefly, in conclusion, to this question of contracts and supplies: it seems obvious to any one who carefully considers the subject that our architects and builders have yet a good deal to do ere they arrive at a really satisfactory solution of this question. They seem, as yet, to have quite ignored the employer of both builder and architect, and we are glad to perceive in this Manchester Report an earnest of a more comprehensive, liberal view of the question. For our own part, we have over and over again reminded our readers of the necessity of regarding the question from a higher and more comprehensive stand-point. The bugbear that really stops the way of progress is the implied necessity of the employer's knowing beforehand to a farthing the precise sum he is to expend. "Implied necessity," we say, for he never really does know it. The true solution seems to lie in the adoption of some such measure as the Glasgow system of quantities, or "schedules." We have often advocated it in the BUILDING NEWS. It was well described in an excellent letter of our Glasgow correspondent, Mr. Gildard ("Taking out Quantities in Scotland," p. 510 of our last volume), and in articles of our own we have shown how this admirable system may be made to serve those two most desirable ends, the determining what instalment is *really* (not fancifully, as now) due to the contractor, and the wholesome imposition of a check on the extravagant ideas of the client and his architect. We recommend the Manchester architects to make a study of, and favour us with a report on, the Glasgow system of contracts and quantities.

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MANCHESTER AND ART.

SEVERAL of the inherent failings of our national character in reference to Art were forcibly illustrated in the proceedings at the annual meeting of the Manchester School of Art, held on Wednesday in last week. In the reports of the Secretary and the Head Master it was stated that during the past year the attendance of students had been greater, and the receipts from fees increased; while the work done, and the prizes awarded by the Science and Art Department, showed an advance upon any former year. The Chairman—Sir Thomas Bazley, M.P.—who had been connected with the school since 1851, and who at the meeting in question presided for the last time, expressed his satisfaction in hearing that the Institution was in a favourable and improving condition, and believed that the school had been the nursery of a better taste in art in Manchester.

During the year, it was shown that 1,276 persons had received instruction through the agency of the Institution, and no less than 366 students had attended the Art School. The receipts had been £1,365 5s., and the expenditure, £1,360 6s. 9d.

These statements formed the encouraging phase of the proceedings; unfortunately, there was a reverse phase, not in accord with the reputation for the encouragement of Art with which Manchester is popularly accredited, nor quite in keeping with the favourable views expressed by the chairman. The Head Master—Mr. W. J. Muckley—concluded his Report by remarking that the services of the best students in his school were lost, because in Manchester there were ready occupations for youths about fourteen years of age yielding higher wages than those obtained by young designers, and, consequently, the better students wished to avoid designing as a profession. This statement amounts to an admission that the machinery and labours of the school are, practically, of no value whatever as regards the specialities of the district. No doubt, the school is doing its work commendably in training students who are engaged in the various studios and art workshops of the locality. But these students are working for the general public, with the certain knowledge that the more their artistic skill as carvers, glass-painters, cabinet-makers, decorators, and other high-class workmen, is developed, the greater will be their rewards. To the great reproach of the Manchester manufacturers be it said that no such inducements are held out to their young art-workmen. Mr. Muckley suggests that manufacturers should make arrangements for their trade apprentices to attend the school on four nights a week for four years, which course of training he considers would, *probably*, fit them to commence work as designers. This is a sorry makeshift scheme, and implies that art-workmanship, unlike all other occupations, is a thing that can be pursued by halves. There is no such easy road to excellence; and it is extremely doubtful whether four years of such training would foster in young students a healthy feeling for their work. When it is considered that the money attraction for youths apprenticed to Manchester manufacturers is only £100, spread over a term of five years, it seems a disgrace that such an insignificant amount should keep out of an art-occupation any youth who possesses the natural talent for its pursuit. For their own interests, as well as for their public spirit, it is to be hoped that an effort will be made by the Manchester merchants to retain the "better students." An average sum of £20 a year for five years, awarded in competition, will do this in the case of each one student, and surely the method and the means for such an object ought to be easily obtained in any wealthy district such as Manchester.

Another discouraging phase was brought to light in the course of the proceedings of the meeting by the statement that an old debt of £135 still remained upon the school, the sum of £5 only having been forthcoming during the whole of the past year towards its liquidation. When we place by the side of this fact another—namely, that almost fabulous sums are constantly being paid by Manchester merchants for single pictures and other art objects, it becomes painfully apparent that Art in this great commercial community has a most unhealthy and perverted significance. Last year Mr. Tom Taylor made an eloquent plea for the extinction of this paltry debt upon the school. His plea has been answered by a contribution of £5; leaving the Chairman to urge again this year that the "small debt" was a "great incumbrance" to the school.

The Bishop of the diocese, who presented the prizes at the meeting, somewhat apologetically said that "in talking about art, he was going rather out of his line." We hope that he may be induced to go out of his line again in the same direction, and use his influence as he did upon this occasion. Referring to the enormous prices given for single pictures, he said that "he was glad that Manchester, so far, encouraged art." But he followed up that remark by indirectly contrasting with that prevailing tendency the truer feeling by which the Athenians were animated. Quoting from a remarkable speech in which Pericles said of the Athenians as compared with the Spartans, "We pursue philosophy without effeminacy, and we love the beautiful at a cheap rate," he went on to say that in the days of Pericles it was not thought necessary to produce a high-class picture that an artist would expect to get three thousand guineas for. Then, without indulging in any extravagance of private life, the public taste was awakened by having presented to it a continual succession of beautiful objects. Pursuing the tenor of his comparison with another period, he said a Roman poet, who was a very keen observer of the manners of the Augustan age, looked back upon the days that were gone, and regretted that his countrymen were spending all their money upon their own private villas—marine villas at Baii, and suburban villas at Rome; whereas in the ancient days men devoted their money to the promotion of great public buildings whose advantages the whole community could share.

The moral of these remarks is obvious. Not less to the point, apt, and commendable were the remarks addressed by Bishop Fraser more especially to the students. He said that he had not rejoiced to hear that young men of art tastes were drafted off into other and more remunerative careers. "He wished that those who had genius would be content to cultivate that genius, and believe that in due time the reward would come. He was not at all sure that the greatest amount of happiness was attained by those who earned the largest sums of money. Simple tastes and pure pursuits were really the things which constituted not only the health but the happiness of a great community. He should rejoice to think that the Institution might be the humble instrument of developing in Manchester a love of the beautiful, which he thought was a much more precious thing than a love of the costly."

There is no especial novelty in these views of the Bishop of Manchester, and to those who are familiar with the subject, they are somewhat trite. Nevertheless, in the present stage of our national Art culture, they are extremely valuable as the opinions of one who has evidently marked the tendencies of a leading community, whose example may have the effect of subjugating Art to Wealth, and of discouraging young men of genius. A broad question arises out of these Manchester facts and proceedings: What can be done to make our wealthy communities alive to their duties in regard to Art? Could the question be merged into one of a political or religious character it would be answered. Organisations, precedents, funds, advocates, and partisans would be forthcoming, and time would bring a certain, if not a complete, success. In this case, something of the same kind must be attempted with the ultimate view of establishing, in all the large centres of education and commercial enterprise, special endowments for the study and true encouragement of Art. This was the method adopted by our forefathers for the advancement of Learning, and such a method must be adopted in these days to meet the exigencies of Art.

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THE DRAINAGE OF BOMBAY.*

THE island of Bombay consists of an alluvial valley running north and south, about six miles long, and flanked on either side by broken ranges of basalt. In the middle of the western range of basalt there is a gap about half a mile long, through which the sea at one time used to enter and flood a great portion of the island. About the end of the last century a stone embankment was thrown across this gap, which, while it has effectually prevented the encroachment of the sea, has impeded the drainage, for the rain, which formerly escaped freely through the gap, now only finds an exit through the small sluices which have been constructed a little to the north of the causeway.

The island is at present drained in the directions in which its different localities slope. The town district, inclining as it does towards the flats which lie near the embankment, is drained in its direction by a large underground sewer which runs along the bottom of the valley, becoming an open drain on approaching the flats, and so continuing to its termination on the western coast. From the point where the underground sewer ends there was five years ago constructed a small low-level sewer, for use during dry weather, which has its bottom at a still lower level than the open drain, and can therefore never discharge its contents into the sea. The sewage is pumped from it during eight or nine months of the year, but during the rainy season the sewage and drainage escape along the open drain and through the sluices. The low level sewer remains full of foul matter till the monsoon has cleared off, when pumping is resumed. Although thus incapable of carrying off the drainage in the wet season, in the dry weather the sewer is enormously too large for its purpose, the sewage in it being then frequently but a few inches deep.

The second district, consisting of a small narrow strip of the island lying about Back Bay, slopes in that direction, and is drained into the bay. There are two main outlets, one near Sonapore and the other near Girgaum, both being intolerable nuisances. The sewage can only escape when the sea-level falls below the mouth of the outlets, and the discharged sewage does not at any time flow out to sea, but simply floats about and increases the nuisance. The third district, to the west of the Elphinstone Reclamation and about Mazagen, inclines towards the harbour, into which it is drained, but the filth, although not so liable to be deposited on the shore as in Back Bay, still produces a nuisance. The Fort and Colaba are isolated districts, — the former has hitherto been drained into the harbour, and Colaba, being a Government military station, and thinly populated, does not need to be considered with reference to any General Drainage Scheme.

It will thus be seen that at present no separation is attempted between the drainage and the sewage, beyond the adoption of what is known as the Hallacore system, which consists in the removal by hand of all solid excrementitious matters from the town to the main depot at Chinch Bunder, from whence the soil escapes by gravitation into the sea. The present state of things is by no means a satisfactory one, and several schemes have been from time to time proposed with a view to improvement. The first was that put forward in 1861 by Mr. Tracey, which was practically based on that carried out in London, and may be termed the intercepting system. He was opposed to the utilisation of sewage, and proposed to drain the higher and lower parts of the island by two sets of sewers, placing the outfall in the harbour. The cost of this project was estimated at £332,000. The system proposed by Mr. Aitken was similar in plan to Mr. Tracey's, except that he was opposed to placing the outfalls so far north, suggesting three spots—the first opposite the Oyster Rock, the second at the extreme end of Colaba, and the third on the "Prongs," out in the sea. He ultimately selected the Lighthouse site, guided by the recommendation of a Government Commission. He was opposed to the separation of the rainfall and sewage, and contemplated the construction of sewers large enough to carry away both, proposing to let as much of the sewage as possible escape into the sea by gravitation, and to pump up only the remainder. During the dry season, or during eight months of the year, all the sewage was to gravitate towards Colaba, where it was to be pumped up into reservoirs, and discharged into the sea at high tide; but during the monsoon, the higher parts of the town were to be cut off from the main sewer running to Colaba, and their drainage and sewage discharged into Back Bay. An important feature of Mr. Aitken's plan was the raising of the very low lying district enclosed by the Bellasis-road, the Duncan-road, the Girgaum Back-road, and the Breach Candy-road, by filling up the area (150 acres) with earth 3ft. deep, thus enabling him to place his sewers 3ft. higher than he could otherwise have built them. The cost of this project was calculated at £1,100,000, and the annual working expense at £25,000. In 1867, Mr. Rawlinson was directed by the Secretary of State for India to consider this plan. He recommended that the sewage should be taken right away to the north of the island, and there utilised on land far away from the inhabited districts. In 1868, Mr. Sowerby, of Surat, proposed to make a large open canal along the middle of the island, from Back Bay to Mahim, communicating at each end with the sea, and having two or three branches connecting it with the harbour at suitable points. This canal was to be from 150ft. to 200ft. wide, and deep enough to admit of the navigation of laden barges, and was to form a catchwater drain for all surface rain water. Two intercepting sewers were to be constructed, one on each side of the canal, at as low levels as possible, so as to get a natural outfall towards the north, and to take advantage of the head of water in the canal for the purpose of flushing if necessary. An alternative plan was proposed of having no intercepting sewers alongside the canal, but to have the main drains all running at right angles to it, and emptying themselves into the sea on one side of the island and the harbour on the other. Against this scheme Major Tullock reported, and with good reason. The proposal to intersect an island like Bombay with huge canals was of itself fatal to any plan of which it formed part, and proved that Mr. Sowerby could have no personal knowledge of the district he proposed to drain.

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* Report on the Drainage and Sewerage of Bombay. By Hector Tulloch, Major R.E., Executive Engineer to the Justices of Bombay.

The plan now submitted to the justices by Major Tulloch proposes to allow all the rain water falling on the island—*not the sewage*—to escape by gravitation into the sea. The first district will be drained as at present in the direction of the flats, but the present sluices will be very considerably enlarged. The second district will be drained into Back Bay by the present sewers, which can be enlarged in the future if necessary, but which at present are of sufficient capacity for all practical purposes. The third district will be similarly drained into the Harbour. The sewage which Major Tulloch formerly proposed to pump at Love Grove, and to send to the north of the island in iron pipes, he now recommends should be conveyed thither by means of a continuation of the main sewer from Love Grove to the north, terminating at a point near Sion, where it would be pumped up into a high-level sewer running across the swamps lying between the island and Trombay. This high-level sewer is to end on the land now being reclaimed by Dr. Hewlett with the dry refuse of the town. It is proposed that the sewage should be utilised at first on the north of the island and on the newly-reclaimed lands, and if experience detects a nuisance, then that the sewage should only be applied to the reclaimed lands and to the lands lying to the north and north-east of Bombay. After use, and when comparatively pure, the sewage is to be allowed to escape into the creek north of Trombay. To the present system in use for the removal of the night soil Major Tulloch is opposed, being of opinion that the substitution of the wet system would be an improvement; but as it has been determined to continue the Hallacore method, he proposes that the night soil should be conveyed by rail direct from Chinch Bunder to the lands under reclamation to the west of Trombay, and there utilised with the sewage. The system of utilisation of the sewage which he recommends is that introduced by General Scott, which seems peculiarly suited for adoption in Bombay. The total cost of this scheme Major Tulloch estimates at £640,000.

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GOSSIP FROM GLASGOW.

[FROM OUR CORRESPONDENT.]

THE Western Club-house is among the latest buildings designed by David Hamilton, an architect who, during a long professional life, commanded the universal esteem of the citizens of Glasgow. Perhaps the quality chiefly characteristic of the works of Mr. Hamilton, in at least his prime and his later years, is masculine vigour. Whatever other fault they may possess—the detail may sometimes lack purity and sometimes refinement—they have never feebleness.

> Void of weak fever and self-conscious cry,
> Truth bold and pure in her own nakedness.

They are singularly free from all meretricious artifice; defects are not sought to be diverted from or disguised by cunning of mere handicraft or costliness of material, nor is regard importuned by any undue obtrusion of special parts or "features." The architecture is as honest as is the masonry—stone treated as stone, and not as wood or plaster.

Although in the Western Club-house there is but little "composition," and much of the detail is exceedingly objectionable, few buildings in Glasgow enjoy greater dignity, a distinction almost wholly owing to the grand breadth of treatment. There is nothing petty about it. All is large and liberal, broad and massive, an outcome of a mind that had no room for littlenesses—playing with "bits," and toying with stones bedded in mortar as if they were gems set in gold. "And to add greater honours to his age," this, although one of Hamilton's latest works—carried on indeed while in his late illness—is wholly different in style from any of those in which he chiefly achieved his fame. In the Western Club-house and a cotemporary work, the British Linen Banking Company's Office, there is a remarkable ready apprehension of the change that was coming over the spirit of architecture, the new and free'r manner that will be ascribed to a succeeding generation.

In thirty years' time the Club-house has become too small, and an addition has just been built from designs by Mr. Honeyman. This addition is a continuation along S. Vincent-street, and much improves the proportion of this elevation, for, although the building is throughout characterised by greatness of manner, in the frontage towards S. Vincent-street the windows are so tall and comparatively so close together that the façade had perhaps as much of the vertical as of the horizontal in its composition. Mr. Honeyman has judiciously carried along the lines of the original building, his principal innovation upon the genius of his example being a bay or oriel window upon the second-floor. This gives interest to the elevation, and although placed at an irregular interval, like to a discord in music, in nowise disturbs the general harmony of the design. But it is possible to "manage with disjointed skill the matter well, the manner ill," and a bay-window resting upon a balcony (a parallelogram in plan and extending lengthwise beyond it), the balcony carried by consoles over a three-light window, seems to be a somewhat illegitimate construction, both æsthetically and mechanically. For the three-light window, the consoles, and the balcony there is warrant from the Buchanan-street elevation, but when consoles have "a double debt to pay"—to carry besides a balcony a bay-window—they should surely be of a more powerful outline and a larger treatment. Mr. Honeyman has thought fit to vary them, and having varied them at all might have varied them more, and made them greater for their greater purpose. The endeavour apparently has been to continue the genius of the design by carrying into the addition in S. Vincent-street a prominent feature from the Buchanan-street elevation, and to compose with this a wholly new if not foreign element, and by this composition to subserve two purposes—to vary by something distinctive the fenestration on two floors which would otherwise have been commonplace, and on the two others to derive from this a legitimate apology for a change of spacing of voids and solids, necessitated from the frontages of the old and the new buildings having to each other (for the design) no proportional relation. This want of proportional relation has also stood in the way of a continuously regular division of the panels, windows, and trusses (a study from Piranesi) which form the frieze, and of the blocks in the main cornice. The one really objectionable feature in the addition is one for which Mr. Honeyman is certainly not to be blamed, for it is only a continuation of what he had before him in the old building—a series of piers in the parapet over the entablature which most provokingly interrupt what would otherwise be a magnificent horizontal line against the sky. If these are not chimneys, or some other absolute necessity that knows no law, the opportunity should have been taken for sweeping them away altogether. An addition to the Western Club-house was not an inviting subject, and this not from the high reputation of the architect of the original building, nor from his manner being so very different from that at the present day, but from the consideration that to do no more than continue the original design would be to render the whole façade commonplace, and that to do more might be to disturb the whole composition. Mr. Honeyman has done more without disturbing, and in that more has added a new interest.

Banks are ever busy building. Besides the magnificent premises for the Clydesdale Company, situated within a stone's-throw of the Western Club-house, and now in progress from designs by Mr. Burnet, a transpontine office for the British Linen Company, designed by Messrs. Salmon, Son, & Ritchie, has just been completed; a similar office for the City of Glasgow Company, designed by Mr. James Thomson, has just been begun; a new frontage for the City of Glasgow's Argyle-street branch has been designed by Mr. Barclay, and the Royal Bank of Scotland is having extensive alterations made upon its interior, from plans by Messrs. Peddie & Kinnear, of Edinburgh. The Royal Bank boasts of perhaps the grandest portico in Glasgow, a study from the Erectheon, and hence showing perhaps little originality, but conceived and carried out with the finest judgment. But if the Royal may boast of its portico, it ought to be ashamed of its return-elevations towards Royal Bank and Royal Exchange Places. These "places" have become great business thoroughfares, and it may be that among the alterations presently in progress, it is intended to give to them an architectural expression worthy of a wealthy company, and of the position they occupy as principal communications between the most fashionable street in the city and the Royal Exchange. "'Tis a consummation devoutly to be wish'd." The new frontage to "the City's" branch in Argyle-street is intended to emphasize the office from the shops on each side of it. In this Mr. Barclay has been eminently successful. The plan is ingenious, and the design, like most of this architect's works, is impressed with a strong individuality. Shakspeare (per Faulconbridge) says that "some sins do bear their privilege on earth;" the torus of the base of a pilaster projecting its semi-diameter beyond the plinth is not one of them.

We have a saying on this side of the Tweed—"The nearer the kirk the far'er frae grace." Of old those that sold and bought in the Temple were cast out, and the tables of the money-changers were overthrown, but the Christians of to-day, wiser in their generation, are about to reverse all this—the University having been converted into a railway station, there is now a serious proposal to convert S. George's Church into a Stock Exchange!

> Having waste ground enough,
> Shall we desire to raze the sanctuary?

Rather, while working a continuous series of promiscuous exercises in addition, subtraction, proportion, and exchange upon the old lunatic asylum and the gaol, shall we make any account of a church dedicated to S. George, and possibly to the drag-on—as if in Scotland kirks were consecrated, or if in Glasgow Stark was appreciated? Perish the thought, and the church with it. An architect is to submit plans of the alterations that will be required, although nowadays architects who have anything in common with the grand and massive style of Stark are, I fear, few and far between. Stark's bold conceptions and singularly appropriate detail show him to have been an architect of alike great original genius and high culture. His works are (or rather were) among the greatest ornaments of Glasgow, and the spire of S. George's Church is eminently characterised by picturesqueness and artistic breadth.

"New lamps for old ones."—*Aladdin.* In Union-street there is coming to completion a building which is "the observed of all observers," and in front of it there have just been placed half a dozen lamps and lamp-irons which are the criticised of all critics. "Critics all are ready made," says a poet who knew something about them, although from the multitudinous and multifarious expression of opinion upon the "Union-street lamps" it might be supposed that of late the great manufacturing and commercial city of Glasgow had been wonderfully busy in alike the production and the distribution of the article. But critics got up in a hurry are not likely to be the best judges of wholly original works, the conscientious result of the earnest study of a lifetime. They may see the originality but not know the merit. A widely-expressed opinion is that the lamp-iron is much too massive for the lamp that it supports. This objection at once vanishes when it is seen that the lamp-iron is in two stages, a pedestal and a tripod. The pedestal is proportioned to the tripod, and the tripod to the lamp. The general design is massive, because that the lamp-iron is a carefully-studied adjunct to the building, or rather, is intimately related with it. *Per se*, the "Union-street lamps" are characterised by a grandeur of conception to which, in works of this kind, Glasgow has been hitherto a stranger; outlined with great power, yet detailed with great delicacy—"strength ever veil'd by grace."*

There is a proposal to erect in Glasgow by shilling contributions a monument to the national poet, Robert Burns. Just now the sum collected in shillings is something over a thousand pounds. What form the monument may take has not yet been discussed by those chiefly interested, but a writer in the *Newcastle Chronicle* has kindly obliged us with a few hints. He says:—"I was glad to learn that Glasgow is about to put Edinburgh to shame in one particular at least. Every one who has visited Edinburgh knows what a miserable monument to the national poet of Scotland, Robert Burns, is allowed to disfigure Calton-hill. It is, indeed, the opprobrium of Scotland that the metropolis of the kingdom should be so disgraced. The Glasgow folk are raising a fund by a shilling subscription wherewith to erect a worthy monument to Burns in S. George's-square." The only monument now possible in George-square, supposing a site in George-square to be sought, and the authorities to grant it, is a statue. Now, the "miserable monument that is allowed to disfigure Calton-hill," "the opprobrium of Scotland," "the disgrace of the metropolis," is a statue, and something more, a statue by Flaxman, and a Greek Temple. The Greek Temples of "the Modern Athens" are among its proudest ornaments, and it will be something new to most people to hear of a statue by Flaxman as either a "miserable monument," or as a "disgrace to a metropolis." I know not why Burns should have a monument in Glasgow. He was in nowise associated with the city; he was the national poet, and his genius has been nationally commemorated—in the mausoleum over his grave at Dumfries, and in the cenotaphs at his birthplace, and in the capital of his country. Glasgow ought to be just before it is generous, and an early, if not a first debt, is due to Thomas Campbell. Of the author of "The Pleasures of Hope," the only public memorial in his native city is a portrait in the MacLellan galleries.

Your readers will, I think, thank you for bringing to a close the controversy on "Greek and Gothic," as it was degenerating into mere fence.

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INDIAN ARCHITECTURE.

LAST week we gave an account of Captain Lyon's first lecture on the "Temples and Idols of India," and on Friday evening, the 20th inst., this gentleman gave the second and concluding portion of his lecture at the rooms of the Society of Arts, to as crowded an audience as was present the previous week.

It will be remembered that on the occasion of his last lecture Captain Lyon confined his attention more particularly to the South of India, but he proposed this time to go in a northerly direction. At the north of Madras, Captain Lyon said, there lies the Tarputry Temple, ruined by the neighbouring Cauvery River, which at some period rose ten feet above it, but which still preserves some of the remnants of its beautiful carving. Like Avadea, Covill, and Tinnevelly, it is built of the same hard, dark stone, and is, if possible, even a greater marvel of patient Indian labour and skill. The Cauvery River is nearly a mile wide, and its disappearance beneath some rocks is marvellous. It compresses itself into narrow limits, issuing at a considerable distance in a volume of spray, which has exactly the appearance of a column of smoke rising many feet into the air, hence the name of the Smoking River. The beautiful Deria Dowlut, with its exquisite verandahs and carvings, the gorgeous colouring of which, though at the present time almost destroyed, earned it the name of the Indian Alhambra, was built by Tippoo, and owned and inhabited afterwards by our great Duke, and is situated on the Mysore plateau, 2,000ft. above the sea. At Bailoor, near Deria Dowlut, is a temple which is so exquisitely chiselled that it is scarcely possible to believe it is not Danish wood carvings we are looking at; they are very small and wonderfully delicate. The more one examines it the more one is puzzled to understand how any one could have even imagined, much less attempted, such a task, and yet here before us it has not only been attempted, but accomplished in such a manner that no one who had not seen it would believe it possible. Luckily this temple is most sacred, so much so that no one is admitted while certain daily ceremonies are being performed, and this has saved it from iniquitous spoliation. Twelve miles further on there are the ruins of Hallabeed, the remains of a large city, of which the walls can be but faintly traced. The Temple of Hallabeed, surrounded with impenetrable jungle, and guarded by snakes and wild animals, had been given over to desecrating loafers, who sold the figures so beautifully carved, and completely destroyed the beauty of one of the marvels of India. A wall is now built around it, and the building guarded by police, to prevent a continuation of a destruction which can never be remedied. The labour bestowed on its carving, the friezes (one of which is 6ft. high and 400ft. long, and exhibits every god of the Hindu Pantheon), the reliefs, the perspectives, and the masterly way in which the immense masses of stone have been pushed forward or thrown back (to obtain at all times a good perspective), remain one of the mysteries and one of the monuments of Indian art. The district of which Hallabeed was the capital was formerly called Dwara Samudra, the walls of which are four miles in circumference. In this temple, as in that of Bailoor, the one great peculiarity is the dissimilarity between the east and west sides. The former, 710ft. long, contains not less than 2,000 carved elephants and bas reliefs. As a marvellous exhibition of patient human labour the world cannot produce its equal. Nor is it for industry alone that the building is remarkable. The mode in which the eastern face is broken up by the larger masses, so as to give height and play of light and shade, is a better way of accomplishing what the Gothic architects attempted by their transepts. If these friezes were spread along a plain surface they would lose more than half their effect; but here the artistic combination of horizontal with vertical lines, and the play of outline and of light and shade, far surpass anything in Gothic art. The effects are just what the Mediæval architects were often aiming at, but never attained so perfectly as has been done at Hallabeed. Near this is the cool, delightful Neilgherry or Blue Mountains, from which is to be obtained a view of some lovely waterfalls, caused by a river which falls 5,000ft. in the short space of two miles; the sight is as pretty as any to be found in Europe. The Todas were the aboriginal inhabitants of these mountains. Near to Neilgherry is to be found the only spot in the world where the oak and orange trees may be found growing side by side. The ruins of Vijianuggur, or Beejnuggur, as it is usually called, is one of the most interesting spots in India. This city, of which a large portion of the walls is still standing, covered an area of seven square miles, and for upwards of two hundred years defied the whole power of the Mussulman armies. At this place there is to be found a small temple dedicated to Hanooman, the monkey god; and it is curious as well as interesting to compare what remains of this Hindoo city with its rival, the Mahometan capital, called Beejapoor. In both we note the same dreary desolation, every trace of human habitations having almost entirely disappeared. At the same time we cannot fail to remark that in the former the beautiful stone temples alone remain to arrest our unqualified admiration, while in the latter there is nothing left of its ancient grandeur except the splendid mausoleums which it was the custom of the monarchs to build during their lifetime to receive their bodies after death. The wonderful Buddhist caves of Karlee are almost the only traces of the Buddhists in that part of India, with woodwork erected before the Christian era. In the royal city of Ahmedabad are to be seen two windows of a desecrated mosque, carved out of granite blocks three inches thick and several feet square, but so delicately executed that they present rather the appearance of lace of wood-carving than stone work. Shutroonije is the sacred hill of the Jains, where there are many temples massed together, containing 3,600 images of marble and alabaster. The Ganges, that sacred river, is held in such veneration by the Hindus that many of them prefer to be drowned in it to living away from it. At Agra is to be seen the Taj-Mahal, that celebrated mausoleum of Shah Jehan, built of white marble inlaid with precious stones, to erect which, like the Mundapum at Madura, cost one million of pounds sterling; and thus we have an opportunity of comparing how the Mahometans and Hindus spent their enormous wealth.

All the places described by Captain Lyon were taken from photographs, and shown by means of the magic lantern. The outlines of the photographs were beautifully clear, and it is difficult to conceive a way in which in so short a time so distinct an idea could be gained of the marvels of the Indian Empire.

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THE TURKISH EXHIBITION BUILDINGS AT VIENNA.

THE great difference between the Oriental exhibits to be collected at Vienna next year as compared with those shown at previous exhibitions, will be that the Vienna collection is to form a true representation of actual Oriental life and civilisation as they in reality exist at the present time, instead of being merely a fantastic show of luxurious splendour and impracticable decorative effects. Turkey and Egypt especially are making great efforts to be worthily represented at Vienna, and the Turkish Government, as well as the Khedive of Egypt, are sparing no expense to illustrate in the most practical manner possible the peculiarities of their respective countries in industry, art, commerce, and social life. It is not the object of these countries to construct pavilions and kiosks—as they indeed exist in the East, though only as gorgeous architectural structures of pomp and luxury—and then to fill them like jewellery shops with all kinds of rare and costly specimens of Oriental wealth; but the Vienna Exhibition buildings of Turkey and Egypt are model edifices, which in design, construction, and interior arrangement will represent the general style of architecture prevailing in those countries, and show their practical advantages for the purpose of being adopted or imitated elsewhere.

Fortunately the construction of these buildings has been entrusted by both countries to the most competent persons, who entered upon the accomplishment of their respective tasks with enlightened views becoming the occasion. It appeared at first that the Turkish buildings would be eclipsed in importance by the Egyptian structures, but more recently the former have made such progress as to put their rivals in the shade. The principal effect of the Turkish style of building is not produced by their external appearance, but by the interior arrangement and decoration. The general management of the Turkish Exhibition has been entrusted to the architect Mantani, a gentleman who, as "Court Decorator to the Sultan," has achieved great reputation in the construction and arrangement of the new palace buildings at Constantinople, by the revival of the pure old Turkish style of ornamentation and decoration, and on whom now devolves the important task of presenting to the European world a general view of the rich artistic, industrial, and commercial productive power of Turkey.

For this purpose a number of buildings are being erected, which, as types of Turkish architecture, will, as regards their practical object, correspond pretty nearly with the several parts of the Egyptian group of buildings, so that, by reason of the contiguity of the groups of the two countries, a very interesting comparison of the peculiarities and differences in the Turkish and Egyptian styles will be afforded to the visitors. The Turkish group will consist of a dwelling-house with bath, a bazaar, a café, another large building which, as "Cercle Oriental," is intended to serve as a sort of casino or club for the Oriental visitors, and, lastly, of a large public fountain. Apart from these buildings, the actual exhibition of Turkish industrial products and manufactures will be located in the extreme eastern side gallery of the Industrial Palace, and consequently close to the group of buildings mentioned.

The Turkish dwelling-house, which is the most advanced towards completion, is externally a very simple unassuming structure, which does not seem to bear comparison with the neighbouring edifices, but it is in reality an exact specimen of a dwelling-house of an opulent Turkish private gentleman, who, according to the custom of the country and the people, attaches little importance to the exterior, but so much the greater attention to the elegance and comfort of the rooms in the interior. During the course of construction certain technical peculiarities of the Turkish style of architecture and mode of construction attracted general attention. The wooden framework has been put together with extraordinary care and almost pedantic exactness, and the firmness and strength of the comparatively weak beams have been increased by their being placed on the narrow side, broadside uppermost. Inside and outside the beams are boarded with slit deal, and the surfaces are thickly plastered with mortar, so as to form hollow walls, which have the advantage of giving greater warmth. The flat roofs are covered with gutter tiles, which is the usual roofing material in Turkey from the palace to the lowest hut. The ground plan of the house and the adjoining bath is rather irregular, and little attractive, but it corresponds to the comfortable and convenient arrangement of the interior rooms, which give the form, as it were, to the exterior. The great number of rooms in the ground and the first floor, which one would hardly expect to find in the building, considering its small external size, are divided into the men's dwelling (Selamík) and the women's dwelling (Haremlik), each of which has its separate staircase. The rooms are not large, but there are many, which very practically communicate with one another.

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* Palgrave's Ode to the Immortal Memory of Free Athens.

Of the interior decoration, which is intended to be rich and elegant, but not extravagant, only specimens are seen for the present; these, however, sufficiently indicate what it will be when completed. There are, first of all, the richly ornamented ceilings in the gentlemen's and ladies' rooms. These ceilings are distinguished by a diversified division of the space, as well as by the liveliness of the forms and the magnificent colouring of the ornaments, although the latter consist only of Turkish letters, the different parts of which, however, are formed of plants and arabesques. The letters form partly passages from the Koran, partly benedictions for the Sultan. Harmonising with the ceilings is the splendour of the colours of the glass framework in the upper parts of the windows, whilst the lower parts, which are at present closed by ordinary European shutters, will be filled in with wooden trellis-work. Very fine specimens of Turkish decorative art, also, are the marble works executed in white stone from the Marmora Islands, which are intended for ornamenting the rooms in the Haremlik, these consisting of cupola-shaped fountains of filigree work, from which will spring from nine to ten jets of water, and chimneys, also made of white marble, the columns and tendril-shaped relievoes giving a very favourable idea of Turkish sculptor work.

The bath, which is built at the back of the house, contains in the ground floor the heating apparatus, and in the first floor two bath-rooms, which are laid out with white marble, and will be provided with very ingenious arrangements for heating by hot air and ventilation.

On the left of the house the bazaar is being erected; this appears to be only a small structure containing four sale rooms. Yet this bazaar is a very interesting specimen of the Turkish style of building, the extraordinarily flat and compressed pointed arches, which are built of bricks with particular skill, form a contrast to the high, small pointed windows of the Arabian architectural style. The wooden superstructure which will be placed on the arcades of the bazaar will serve as a store-room for the shops in the ground floor.

Adjoining the bazaar will be the Turkish café, a neat and elegant building, which is erected on an elevated terrace, and surrounded by a verandah. In this building, also, the exterior is distinguished by ornaments in the shape of railings, gables, &c. Particularly beautiful will be, according to the plan, the painted windows of this café, which show that the Turks are also masters in this branch of art. The beautiful plastic ornaments are enlivened by variegated but tasteful paintings. Behind the café, a kaïk, one of the fantastic Turkish gondolas, will be stationed on the so-called Heustadel water. The "Cercle Oriental," which is being erected on the other side of the Turkish dwelling-house, facing the Fine Arts building, will be a pretty large edifice with a high open staircase. It will be of an Oriental character, flanked by two pavilions, one decorated in the Turkish, the other in the Chinese style.

The most important Turkish edifice, in an artistic point of view, will be the fountain in the centre of the large garden ground, between the Industrial Palace and the Fine Arts building. The rougher parts of this fountain are all finished, and the workmen have begun to execute the decorations. This fountain will be an exact facsimile of one of the finest and largest monumental buildings of Constantinople, viz., the fountain of Sultan Achmed III., which is situated in the principal square of the Turkish metropolis, between the Sublime Porte and the Aja Sophia. The erection of this monument in Vienna is also of historical interest, in so far as it was under Sultan Achmed III. (1703-30), that in consequence of the defeats it suffered, at Peterwardein and Belgrade, from the Austrian army under the command of Prince Eugen, of Savoy, the military power of the Osmans ceased to be the terror of Europe. As a memorial of the association at the Universal Exhibition of Turkish culture with that of the Western world, Achmed III.'s fountain has not been inappropriately chosen, as it was in the reign of this sultan that the introduction of European institutions into the Turkish empire commenced.

In its principal forms the fountain has a somewhat heavy and clumsy appearance, which is rather increased by the far-projecting flat roof, with the unsightly cones which, however, are favourites with the Turks. The broad surfaces of the walls of the four fronts are, however, cleverly concealed by the marble ornamentation in relievo by which they are covered, which at the buildings in the Exhibition grounds is supplied by plaster casts after the original. These relievos belong to the finest specimens of Oriental ornamental work, as well from their richness as from their variety of design, and the combination of imaginative freedom and realistic truthfulness in the execution of the botanical forms employed as ornaments. Each of the four fronts is differently decorated, the arrangement of the doors, niches, pillars, consoles, continuously changing, whilst the sculptures and relievos have not the somewhat monotonous natural colour of the stone, but are tastefully painted and gilded. There are, besides, projecting at the four corners, round balconies, the high bay windows of which are filled in by gilded bronze trellises. The fountain itself is railed off in the interior of the building, and people will have to reach their pitchers and vessels through the openings in the trellis work in order to fill them. One of the most beautiful subjects of the relievo tablets with which the fountain is ornamented consists of vases with flower bouquets. Nothing can be more natural, and, at the same time, more artistic in style than the large full roses, lilies, pinks, and fruit stems, every leaf and every branch of which is formed with life-like accuracy, and produces the impression of a piece of ornament executed with the most artistic care.

Between these ornaments runs, as in all Turkish works of art, the fantastic conglomeration of letters of Turkish proverbs and sayings. The golden letter forms on a blue ground have likewise an ornamental character, and the sense of these Turkish sentences agrees with the object of the building, praising, as they do, the water in the interior, "the waves of which surpass the Semsem of Mekka and the paradise well Selsebil." The Koran text, "All things live by water," is frequently repeated.

In the gallery devoted to the products of Turkish industry and manufactures, workmen are busily occupied in putting up the glass cases and pedestals for placing the Turkish drapery figures. Here is also to be seen the model of the Turkish coat of arms, of enormous dimensions, 3 metres high, by 5 metres broad, which will adorn the gables above the portals of this gallery. It consists of a round shield, with the monogram of the Sultan, crowned by an open Oriental helmet, and surrounded by banners and horses' tails with the crescent. The Turkish Industrial Exhibition will be so extensive that five additional intermediate spaces between the pillars had to be assigned to it in the principal gallery as well as in the opposite side gallery.

The workmen who execute the Turkish buildings are not Turks by their nationality, but Greeks, Armenians, and Bulgarians. They have only three kinds of tools—a peculiar double axe, a short hand-saw, and a gimlet. But with these simple tools they produce more work of this particular kind than the European artisans; so that, notwithstanding their high wages of eight francs per day, and despite the travelling expenses, it was found advisable to engage thirty-five such workmen to come to Vienna to finish the Turkish buildings.—*Engineering.*

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THE FLIXTON TUMULI.

THE Rev. Canon Greenwell, of Durham, has just completed the opening of two large tumuli on Flixton Wold, in the vicinity of Hunmanby, near Filey. The first barrow opened was 28ft. in diameter and 3½ft. high, being formed of chalk and earth. At a point 13ft. south of centre and outground level was a "food-vessel," which, no doubt, accompanied the remains of a young child which had gone almost wholly to decay. At 8½ft. S.S.W. of centre was another food-vessel, and close to it the much-decayed remains of another young child. At 9ft. S.S.E. of centre, at 1½ft. above the surface level, was a third food-vessel, also with the remains of a very young child, very decayed. At 9ft. S.E. by S. of the centre, on the surface level, was the body of a child, unburnt, with the head to the S.E., and at 5ft. S.W. by S. of the centre, the body of an adult, having the head to S.S.E. and the hands upon the chest. This was upon the surface level. At 7ft. W. by S. of the centre, and upon the surface level, was the body of an old person, laid contracted, on the left side, the head being to the N. by W., the arms being crossed over the chest, and lying (on the arms and between the knees and the head), a child, very young, in the same direction, and with the hands to the knees. Upon the surface, at 9ft. E. of centre, was the body of a young person, laid upon the right side, the head being to the east, and the hand up to face. There was a large quantity of burnt bones in close proximity. At 7ft. N.E. by N. of centre was a body on the left side and upon the surface level, the head being to the E.S.E. and the hands upon the knees. Before the face was a richly-ornamented drinking-cup of novel type in the North of England, though one or two of a similar type have occurred in the Wiltshire barrows. The vessel had the peculiarity of a raised or prominent member about an inch above the bottom—a very unusual feature. At 7ft. N.N.W. of centre, and 1ft. above the surface, was the body of a large-framed man upon the left side. The head had originally been to W. by N., but had been cut away when the mound on some previous occasion had been opened through the centre, and (with other bones) had been laid in below the pelvic bones. A greatly oxidised carving-knife showed that this had been done in comparatively modern times. Just to the N.W. of the present centre—the original centre previous to the erosion of the barrow by the weather—was the edge of a grave in the rock, being N. by W. and S. by E., 5ft. 6in. by 4ft. 6in., and 3½ft. deep. In this grave, just below the natural surface, and on the north side, was a deposit of burnt bones, and a few inches below them a food-vessel of peculiar form. At the bottom of the grave, which, though in the rock, was flagged throughout, was a body on the right side, the head to the S.S.E., the hands up to the face, and the head close to the south side of the grave. Before the chest, and what had evidently pinned the garment, was a curved pin, 7in. long, and made from the tusks of boar, three holes being bored through the broad flat end. Below the head was a knife, also made from the tusk of boar. At 9½ft. N. by. W. of centre, and just above the surface level, a body of a child was found lying on the left side, the head being to the W. by S. Before the face was another food-vessel.

The second barrow was close to the entrenchment above alluded to, was of 36ft. diameter and 5ft. high, being formed of chalk and earth. At 8ft. S. and E. of the centre there was a body on the left side, the head being to E. by S., the right hand on the hip and the left at the elbow. The burial was 1ft. above the natural surface, and was covered with large slabs of chalk. At 7ft. S.W. by S. of the centre, and 1ft. above the natural surface, was the body of a child, laid head to the south, and by the side large masses of men's bones, which had been disturbed and laid in again principally near the head of the child. The adult burials had been disturbed to put in the child. Scattered about were numerous burnt human bones, some pieces being 7in. long and partly calcined. At 6½ft, S.W. by W. of the centre was the body of a man laid on the right side, the head being to W. by N., the left arm straight down, and the right to the hip. The lower part of this man had been cut away and some of the disturbed bones found with the child were belonging to this body. At the centre, where, for a depth of 3½ft., and about 4ft. diameter, there were great quantities of burnt earth and other burnt matter, among which a body was laid on the left side, the head to the E.N.E., and the hands up to the head. At the knees was a drinking-cup of small size, rudely though peculiarly ornamented. At 6ft. S.W. by W. of the centre, and 2ft. above the surface, was a body on the right side, the head to the W.N.W. At 5ft. N. of the centre, just above the surface level, was the body of a young child, the head to the south. At 9ft. S.S.W. of the centre, measuring to the centre of a grave N.W. by S.E., 9½ft. by 6ft. and 5ft. deep, at a depth of 4ft., was the body of a young woman of about 19 years, laid on the right side, head to the south and hands up to the face. Below the head was a flint scraper, and at the elbows three beads of bone, all having on both faces the pattern of a cross, differently arranged. Below the pelvis was a fourth bead, of similar shape but plain, along with a bronze drill, square at the centre and tapering off to both ends. At the face was a food-vessel. Flat slabs of chalk were set round the body. The whole skeleton is in perfect preservation, the teeth are like pearls, and the bones of a beautiful white tint. All have been carefully preserved, and Canon Greenwell intends to have the whole properly articulated. At the bottom of the grave on the left side, the head to N.E. by E., was a man, the hands being each on the opposite elbow. Half of a flint knife and a round scraper were near the head—not apparently associated, but probably belonging to the disturbed burials. At 9ft. N.E. of the centre was a body on the left side, the head to the E.S.E., the back being not bowed. The hands were to the face. Touching the teeth were a long and round scraper, and under the head was a large spoon-shaped scraper. Before the body was a thin line of decayed wood, nearly 3ft. in length, and being possibly the remains of a club or some instrument of that kind. This body was 1½ft. below the ground level. At the knees was a skull, with the upper jaw of another body, the rest of which was found about 2½ft. above, and partly cut through, but it had been laid on the right side with the head to the north, the lower jaw being left. Upon the knees was a round scraper. Both above and around the perfect body were scattered bones of an adult and a child. At 8ft. N.W. of the centre (the present one), was a grave E. by S. and W. by N., 6ft. by 4ft. and 4ft. deep. In the centre on the bottom was a body on the right side, the head being N.E. by E., and hands upon the chest. Under the neck was a bone button of the ordinary form of the well-known jet buttons, which had doubtless fastened the dress. Behind the shoulders was a food-vessel. The head of this body was protected by 3 stones, and one over them—a sort of cist. The barrows proved to be as interesting as any yet opened in the East Riding.

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MEMORIALS OF THE WHITE FRIARS OF COVENTRY.

THIS was the subject of an interesting paper, read by Mr. W. G. Fretton, of Coventry, at the meeting of the Archæological Section, in the Secretary's Room at the Midland Institute, on Thursday week. Mr. Fretton, after some preliminary remarks, said the White Friars or Carmelites took their name from Mount Carmel, where their order first originated. They claimed considerable antiquity, dating back to the time of the prophet Elias. It was not, however, until the latter part of the twelfth century that their organisation properly commenced. Their first introduction into England appeared to be about 1240. They appeared to have had about forty houses in England, but the order did not gain a footing in Warwickshire until the fifteenth year of Edward III., when William de Engleton gave to the Provincial Prior of the Order of Mount Carmel in England one messuage and ten acres of land in Coventry, on which land Sir John Poultney erected a house for them. After giving some historical details, Mr. Fretton said it appeared to have been a common arrangement for the carpenters and their guilds to hold their feasts at the Friars' house; for in 1477 there was a memorandum recorded in the Carpenters' Company's books of the expenses of a dinner at the White Friars. Having traced the history of the house of White Friars at some length, Mr. Fretton described the remains which were still left. As might have been expected, on the purchase of the building by the Board of Guardians, great alterations and additions were made to render it suitable to the purpose of a house of industry. The wonder was that so much remained of the original fabric. The monastery was situated within an angle formed by the east and south portions of the town. From the fragments which remained it appeared to have been arranged round one cloistered area. The principal entrance to this court was still standing, though it was much mutilated. A few years ago it served as a gas-house; it was now a fowl-pen. The roof was richly groined. This portion stood at the south-west corner of the inclosure, and communicated directly with the south avenue of the cloister, the greater part of which was now gone. Two of the eastern bays of this part of the cloisters still remained, minus their vaulting, and with the external openings altered or stopped up. Occupying the site of another bay, westward, was an elaborate doorway opening into the court, opposite to which was another archway. The eastern walk of the cloister was the most perfect of the building remaining. It was 260ft. in length, by 12ft. in width. It was richly groined, and its western face was divided into nine bays. After an elaborate description of the cloister Mr. Fretton said it now served as a dining-room for the inmates of the workhouse. Mr. Fretton then gave a minute description of other remains. As to the church, which was detached from the monastic buildings, all above ground had disappeared. Some massive remains on its site had just been laid bare, but they had not as yet been sufficiently excavated to indicate what part of the edifice they belonged to. He thought, however, it would prove to be the basement of a tower. The style observable in all the buildings was Decorated, which prevailed in the fourteenth century, when the monastery was built; but fragments occasionally appeared of decidedly a later date.

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THE "RESTORATION" OF CHESTER CATHEDRAL.*

YOU did me the favour to publish a letter some twelve or eighteen months ago, protesting against the so-called restoration of our cathedral and abbey churches, which I have had reason to hope has not been altogether without effect upon the public mind. Its object, I believe, would be further promoted if the public were made aware of the change which, by the process in question, now nearly completed, has come over Chester; where, in this historic city of the Romans, full of objects of antiquarian interest, the most interesting object of all, as being the creation of more earnest minds than are now directed to architecture—I mean the Cathedral—an object that came over the mind of the visitor like a slow and solemn strain of music—is, in effect, destroyed; in other words, its most venerable face, luminous with the history of ages, is covered with a lifeless mask of new masonry, and is now nothing more than a modern Gothic church, claiming kindred with those mushroom erections that are springing up by the dozen around Liverpool, and not a whit superior to them, for in the new work not one trait of beauty or interest seems to have been attempted in atonement for the loss of the old, the only new feature introduced being one that makes matters worse rather than better; I allude to the conical roof raised over a chapel of the south aisle, the ugliness of which only calls to mind the similarly-shaped glass-house chimneys that disfigure the neighbourhood of S. Helen's. "Oh, save me from my friends!" might the genius of Chester have exclaimed on its first introduction to the restorers, for neither Welshman nor Puritan warrior has done it half so much mischief as its present well-intentioned clergy, whose "restorations" must be felt as a general calamity by all people of taste. The Parthenon, when despoiled by Lord Elgin, re-appeared in its sculptural and architectural fragments in the British Museum, to cultivate the taste of other races and generations unborn; but Chester Cathedral has virtually disappeared from the earth, with its delicate and beautiful carving, one square foot of which that retained any vestige of its pristine beauty, such as that of the west front and consistory court, was worth the whole of what has been substituted. The metamorphis of the tower, which was the chief object of interest in the general physiognomy of the city as seen from a distance—its most characteristic feature—the apple of its eye, as it were, and which wore an expression of venerable grandeur and pathos, and was in full harmony with all about it, has changed the character of the scene, and will be daily felt for miles round. To the heart and imagination it is no longer the same, but an intruder; for these will not be so cheated into illusion, but will instinctively look for the old structure, on which the storms of centuries have spent their fury, and the contemplation of which awoke the imagination of the dullest to dim and dreamy associations with past ages.

The disappearance of a number of ancient domestic buildings around and in the vicinity of the Cathedral —all that were picturesque and characteristic of the place—is, perhaps, scarcely to be regretted, since the object they seemed to belong to and to have grown up in harmony and sympathy with is no more; but their loss will be felt by many.

The Dean of Chester, in a recently published work, entitled "Chester as It Was," replies to the complaint of their "destroying the past and erecting a new building," that "it is a mistake," and that they "are really enabling the present and future generations to see the past, which for centuries had been hid." But he has not explained how cutting away for ever the old face of the building, all that the past had produced, and all that the past and present had looked upon and loved, and hiding what was behind by new masonry, can enable the present or any other generation to see the past. If he means, and really thinks, that the present generation see in the new erection exactly what the Cathedral was in its prime, nobody is more mistaken than himself; and he has yet to learn that to restore the edifice to what it originally was, £60,000, the estimated cost of the works, would not only be insufficient, but £60,000,000, for it is utterly impossible.

It is too late to save the once venerable Cathedral of Chester, except its cloister, which, it is to be hoped, will escape the fate of the rest of the building; and I chiefly point to the disastrous result of the "restoration" process thereon, in the hope that it may have a beneficial influence on the future treatment of that large and interesting class of works to which Chester Cathedral belongs, most of which are of a richer and superior character of design and ornamentation to that example; a class of works which, it should be understood, were the greatest monuments of Christianity, reared in their palmiest days for glory and beauty, as trophies of the religion when she had surmounted every obstacle and had become triumphant, and on the production of which all superior intelligence, and the best art-genius and skill of the middle ages were concentrated. Being the exponents in stone of an inspired imagination, of a depth of feeling, and a passionate sense of the beautiful in nature, beyond what was, perhaps, ever before or since applied to architecture, reflecting through the symmetry of human design whatever is most beautiful in the works of the Great Creator, they must have been objects of delight to the imaginations of all people of susceptibility, not only in the age of their erection, but through all times since, and have enriched and fed the human mind with images of tenderness and beauty.

To think to bring back the original beauty, when once destroyed, of such structures as these—the production of men who poured out their whole heart and soul upon their work, and wrought for the love of art and the glory of God—is as absurd as would be the attempt to restore the Torso or any other mutilated Greek statue in the British Museum to what it was when it first left the studio of the artist. It would be absurd to attempt it by any means; how much more by the chisels of common masons and architectural carvers, working neither for the love of art nor the glory of God, but simply for so much a week! Such a gross idea of restoring a work of architecture may be excusable in non-professional persons, but it is surely unworthy of architects; and those who entertain it must have not only a very faint notion of what these Mediæval piles of architecture and sculpture were in their prime, but a gross idea of the nature of art or architecture itself, to which the very idea of restoration or renewal is utterly abhorrent. They can have no sympathy with the finest impulses of the imagination, and must be void of the taste whose province it is to perceive excellence in its several kinds and degrees, and to appreciate the last refinements in architecture.

Time and accident and the natural influences of the atmosphere have so intensified the original beauty of these piles, on every "jutting frieze, buttress, or coigne of vantage" of which poetry, like the birds, has made her nest, rendering them, perhaps, the most beautiful and touching works of man on the face of the earth, that if it were possible to restore them to their primal condition, it would not be desirable to do so; and the only operation to which they should be submitted is that to which all other kinds of buildings are submitted when they become dilapidated or out of repair, that of reparation, not of renovation or renewal, which this "restoration" is, and which, in the case of edifices whose chief interest and value lie in their antiquity, is tantamount to destruction.

SAMUEL HUGGINS.

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* From the *Athenæum*.

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NORTHERN ARCHITECTURAL ASSOCIATION.

AN ordinary quarterly meeting of the above Association was held on the 19th inst. in the Old Castle, Newcastle. The chair was occupied by Mr. T. C. Ebdy. The election of officers for the next year took place, with the following result:—President, Mr. M. Thompson; vice-president, Mr. T. C. Ebdy; honorary treasurer, Mr. J. Hogg; honorary secretary, Mr. T. Oliver; honorary solicitor, Mr. G. W. Hodge; committee: Mr. Johnstone, Mr. Oswald, Mr. W. Henman, Mr. George Connell, Mr. E. Thornhill, Mr. T. Reay, Mr. W. J. Shotton, and Mr. F. Charlton.—Mr. T. Oliver, the secretary, read an able paper on the "Newcastle Town Moor Schemes." After explaining the principal features of various Town Moor schemes, the writer asked the question—"What will become of the Moor?" and Mr. Oliver proceeded to answer it by a scheme of his own. Supposing, he said, a grand road was made all round it at the extreme outskirts; suppose it planted and wooded; suppose that in this handsome residences were to be erected; suppose that parks and open playing spaces were left of twenty or thirty acres each; that the whole place was sewered and drained and laid out for general purposes, would the death rate be increased or decreased thereby? He contended that the death rate would be decreased if they built in a proper manner. Mr. Oliver concluded by asking them to compare the Town Moor with Jesmond Dene, and hoped that before the end of the present decade the Town Moor would be sewered, planted, and laid out with a grand road.

ORIENTAL ART EXHIBITION AT LIVERPOOL.

THE members of the Liverpool Art Club, a new institution, founded on a similar basis to that of the Burlington Fine Arts Club in London, have just opened to the public, for a few days only, their first exhibition. It consists of a collection of objects of Oriental art, many of which are not to be equalled elsewhere in this country; and although the space at the disposal of the Club is limited, so that the specimens are somewhat crowded, and there is not a superabundance of room for spectators, yet the exhibition is one which all who are interested in such matters should strive to see. It is held at the rooms of the Club, 4, Sandon-terrace, Upper Duke-street, Liverpool, and was at first intended to be open for ten days only. It has now been decided somewhat to extend this period, probably until about the middle of January.

A very complete and valuable *catalogue raisonné*, edited by Mr. G. A. Audsley, arranges the objects exhibited in eight sections—namely, Enamel, Persian Ware, Satsuma Faïence, Kaga Ware, Lacquer Work, Porcelain, Ivory Carvings, and Metal Work, besides which a few specimens are classed as Miscellaneous. The enamels amount to almost a fourth of the entire display, and are mostly examples of the old cloisonné work of Japan. To this department five or six members of the Club have been able to contribute; but the great majority of the enamels are from the collection of Mr. James L. Bowes, to which there is probably no rival in the world. Mr. Audsley, in his catalogue, gives a brief account of what is known of the history of enamelling, and of its three chief forms—the cloisonné, the champlevé, and the painted. The Japanese work is entirely of the cloisonné variety—that is, it consists of a metallic basis, on which a pattern is formed by fine filigree work of flattened wire, secured by one edge to the basis, and so projecting as to form a multitude of cells or cloisons, in which the metallic pastes which constitute enamel have been placed, fixed by firing, and finally ground and polished to a smooth surface. In Chinese cloisonné, in much of the modern work of Japan, and in most of the European examples, the cloisons are comparatively large, and the general effect is coarse and staring; but in the old Japanese enamels the cloisons are of the most exquisite fineness and finish, producing patterns of extraordinary elaborateness and delicacy. As a single example of this delicacy, it may be mentioned that leaves, not exceeding half the size of a barleycorn, invariably have their edges finely notched or serrated; and that many of these leaves, which are evidently intended to be seen in profile, when folded or closed like those of a sensitive plant, are thus notched upon one side only. The patterns produced are not only floral, but include a vast number of geometrical devices, variously checkered and diapered, many known armorial bearings, and others that are so interpreted, and representations of actual or mythical birds and beasts, and, in a very few instances, of the human figure. But the beauty and grace of the designs are in most cases wholly subordinate to the charm of the colouring, which combines the qualities of richness and sobriety in a manner that no verbal description can adequately convey. The richness is such as might be expected to be communicated by artists capable of appreciating the luxury of colour. The sobriety is doubtless due to the knowledge that the glowing surface would be lighted by all the glories of an Eastern sun. For the combination of the foregoing qualities in the highest degree the visitor would do well to disregard some of the more conspicuous examples of the work, and to devote careful attention to a pair of comparatively small vases in the central case, numbered 23 and 24 in the catalogue, where they are further described as of "quaint form and exquisitely fine workmanship, covered with most intricate ornamentation, consisting of minute scroll-work, small flowers, rosettes, and detached diapers of beautiful design."

The manner in which the ancient enamels have found their way out of Japan is enveloped in a good deal of obscurity. They first made their appearance a few years ago in Europe and America, and were for a time somewhat lightly regarded by dealers and *virtuosi*. Until then they had been absolutely unknown. "Neither the large collection of Japanese curiosities at the Hague," writes Mr. Audsley, nor "Siebold's Museum at Leyden, contains a single specimen of the art; and, with one unimportant exception, we have been unable to find any allusion to it in any work written by residents or travellers in Japan." It is surmised that the enamels must have been treasured up in great houses which were plundered during the recent revolutionary movements in the country, and that the spoils were sent abroad for sale. This surmise rests partly on the armorial bearings which form part of the designs on many of the pieces, partly on the circumstance that many of them had been disguised by having paper pasted over them, and partly on the fact that the supply has now wholly ceased. The attention lately given to the subject has produced a demand, and several eminent persons have despatched agents to Japan to seek for the ware. The demand has produced an abundance of modern imitations, coarse in execution, blotchy in colouring, and, although often artistic in design, presenting no trace of either the manual skill or the loving patience of the craftsmen of a bygone time. The old enamel has disappeared from the market, and collectors who now part with their specimens will probably find it impossible to replace them. Among the more conspicuous shortcomings of the modern examples of cloisonné may be mentioned their weight. The ancient vases and dishes, when enamelled on both sides, may be not more than one-sixteenth of an inch thick, and are of corresponding lightness. The modern, at least as thick again, are betrayed by their weight alone as soon as they are lifted in the hand.

Among the most conspicuous of the armorial bearings on the enamels in Mr. Bowes' collection are the crests of the Mikado himself. These crests are two in number, the kiku and the kiri. The former is a back view of an expanded chrysanthemum flower; the latter is a sort of trefoil of drooping leaves, from which three spikes of blossom ascend. The presence of these marks is a certain indication that the articles on which they appear once formed part of the furniture of an Imperial residence; and we are informed that in Japan they could neither have passed to inferior ownership by any recognised or honest means, nor be used by any one not of the Imperial family. Besides these crests, there are frequent representations of the ho-ho, or mythical bird of Japan, together with the *Paullownia Imperialis* the tree from which the leaves and blossoms of the kiri crest are derived. The ho-ho is supposed to inhabit celestial regions, and only to descend to earth on the occasion of some happy or auspicious event; and its appearance on a vase or dish, in connection with the Imperial tree and the Imperial insignia, is supposed to denote that the article was made in honour of the birth of a prince, or of some similar or analogous event.

Besides the enamel on copper, there are a few specimens on porcelain; and it will be remembered that some bowls of this description were among the articles exhibited by the Duke of Edinburgh at South Kensington. On close inspection, however, it becomes evident that this work is of a totally different character from the true enamel, that the pastes are softer, and that they have been fired at a less intense heat. The surface is smooth, but not polished, and the sensation it conveys to the touch is very different from that of the genuine cloisonné.

It is, perhaps, an advantage of the small size of the Exhibition rooms that the visitor is enabled easily to take a general survey before selecting objects for special examination. For this reason it is hardly necessary to mention in detail the specimens of the greatest interest. We have already called attention to the pair of vases that we regard as the gems of the collection, and the catalogue contains an amount of description which is fully sufficient for the guidance of sightseers. The Temple lamps (Nos. 1 and 2), 62½in. high, and the vases (Nos. 3 to 6), 43in. high, are not only of superb quality, but are also noteworthy as the largest known works of their respective kinds. A very beautiful cabinet (No. 192), exhibited by Mr. W. J. Audsley, is further interesting, not only for its beauty, but also as an application of the art to an unusual purpose.

The third and fourth sections, the Satsuma faïence and the Kaga ware, are also illustrations of the high character of Japanese art, and comprise such collections as have never before been brought together in Europe. Mr. Audsley describes the Satsuma ware as follows:—"The body is a faïence of delicate tints, varying from pale gray to a warm buff; the most commonly met with is a cream or vellum tint. On these softly-toned grounds, which are covered with a transparent glaze, in nearly all cases finely crackled, figures, birds, flowers, and conventional designs are painted in gold and colours in the most exquisite manner imaginable. The freedom and artistic grace infused into every line of the flower and bird decorations are among the most remarkable features of this ware. The qualities of the glazes vary considerably in different specimens, some presenting a highly-vitrified and glossy surface, and others a waxy appearance; all varieties are crackled. The older ware frequently has the semi-dead or waxy glaze, and can easily be detected by the touch." The Kaga ware is made in a province to the north-west of the island of Niphon. It is much esteemed by the Javanese, and seldom leaves the country, most of the specimens in the collection now at Liverpool having been sent by the Government of the Tycoon to the Paris Exposition of 1867. Mr. Audsley says of it:—"As far as our information at present goes, there appear to be two distinctly different kinds of ware produced in the province; the first being a porcelain, of various qualities, painted in a most elaborate manner with rich red, relieved by gilding; and the second, a porcelain, or a faïence, painted partly with red and gold, and partly with medallions filled with figures, landscapes, birds, and flowers in brilliant enamel colours. Fine specimens of both these methods are exhibited."

In these two wares Mr. James Bowes is again one of the principal contributors, and his specimens are mostly of remarkable excellence. The Satsuma vases (Nos. 294, 295) are especially noteworthy; and the small bottle (No. 314) is interesting alike from its excellence and its great antiquity. Mr. G. A. Audsley contributes a "Hibatchi" or fire box (No. 308), which is peculiar in the style of its ornamentation; and also, among many other specimens, a basin (No. 327), richly decorated with floral designs in colours and gold. Together with this basin are shown a box and a red and white silk wrapper, in which its sometime Japanese owner was wont to envelope it, and which testify strongly to the esteem in which it was held in the country of its production. The best specimens of Kaga ware are two vases (Nos. 353, 354), exhibited by Mr. James Bowes; but the whole of the collection is well worthy of the careful attention of connoisseurs.

We must not dwell in detail upon any of the other sections of the Exhibition. A lacquer cabinet of marvellous workmanship and great beauty will at once arrest attention, as will also several specimens of metal work, chiefly Japanese. Among things likely to be overlooked by reason of their small size are some Japanese carvings in ivory, of wonderful spirit and workmanship. They are mostly little groups, representing scenes, some familiar, some allegorical. Among the former should be mentioned a confused heap of children rolling over each other at play; among the latter, two men, one of whom is attempting to tie up a fox, which the other man holds. The first man holds his string in his mouth, and is considering with puzzled face how he may best arrange it round the limbs of the struggling captive. Another group represents a lady seated, playing a musical instrument, and unconscious of the vicinity of Death, who is dancing to her tune. These groups do not exceed four or five inches in height, and some of them are much less; but they are all alike in the skill with which the emotions and expressions have been rendered by the tools of the carver.

The club promises shortly to hold an exhibition of etchings, and will, it is to be hoped, long prosper in its endeavours to promote a love of art in the locality, and to make the treasures of a few occasionally accessible to the general public. The first Exhibition is not only eminently successful in itself, but it has also led to the production of a catalogue which is no mere temporary guide to the objects shown, but is of a value which will secure for it a permanent place in the libraries of the members.—*Times.*

CHIPS.

The parish church of Berechurch was re-opened on Sunday last, after restoration, under the direction of Mr. C. Pertwee, architect.

The foundation stone of a new Wesleyan Chapel was laid at Wallingford on Tuesday week.

The will of Mr. John Chubb, of S. Paul's Churchyard, lock and safe manufacturer, according to the *City Press*, has been sworn under £70,000.

A new theatre has been opened at Melbourne, Victoria. The style is Byzantine. The pit will seat about 1,000 persons, the stalls 550, the dress circle 550, the upper circle 650, and the gallery 1,200.

Plans of a new church at Manea, in the Isle of Ely, by Mr. Ruddle, architect, of Peterborough, have been approved. The estimated cost of the building is £2,700.

A prospectus has been issued of the Steam Stoker Company (Limited) with a capital of £130,000 in shares of £10, to carry out, on a large scale, the substitution of machinery for hand labour in the charging and discharging of gas-retorts.

London is supplied with water by eight companies; recent returns show their total capital to be over £10,000,000, and that last year their net revenue was £666,608, or £6 13s. 2d. per cent. on the capital.

A machine has recently been invented by a citizen of New Haven for printing in coloured and gilt enamels on china and pottery, which will greatly reduce the cost of the process.

THE PALACE VECCHIO, FLORENCE.

ABOUT eighteen months since (June 16th, 1871) we gave some details of this historical palace, the foundation stone of which was laid nearly six centuries since, and we to-day give an elevation of the building. The building has witnessed some of the most remarkable changes in the history of Florence. It was once the seat of a Republican Government, and afterwards became the palace of Cosmo I. Here are preserved the statues of David and others by Michael Angelo, and also the frescoes by Vasari illustrative of the history of the Medici family. We hope to give another sheet of details from the building soon.

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ANCIENT WOODWORK.—ROOFS.

WE give this week illustrations of two specimens of ancient woodwork—namely, the roof of Spicer's Hall, Bristol, and the roof of Canynge's House, Bristol.

Spicer's House, of which we give a portion of the roof, is situate on that part of the Bristol quay known as the "Welsh Back." "Proceeding by a passage to a court-yard," says the author of "An Analysis of Ancient Domestic Architecture," "in the rear of the house, there are the remains of the screen (see portion of illustration) forming the entrance to the hall, now entirely bare, deserted, and decayed, the dimensions of which are 32ft. by 21ft. The roof, which longitudinally is divided into ten bays, is plain, but good in character, and consists constructionally of principal and common rafters, collar, and purlins, the angles of which are chamfered, and moulded wall-plate. Under the collar, which is high up between the rafters, is a main arch, with chamfered edges, resting at the foot on a foliated capital in each alternate truss, the intermediate one abutting direct on the wall. There are two lines of arched wind-braces, the centres of which alternate one over the other. The wind-braces are traceried, and the general effect is exceedingly good." The work dates from about the middle of the fourteenth century.

We also give details of roof of Canynges' House, Redcliff-street, Bristol. These are taken from the same work, "An Analysis of Ancient Domestic Architecture," and date a century later. "The roof shown is in three bays, and consists of moulded principal rafters and common rafters, and moulded collar, under which is the main arch of the roof, which again is sub-arcuated, with a leaf ornament instead of cusps, and with tracery in the spandrels. The corbels supporting the arch of the roof are angels bearing shields. The purlins are moulded, and the common rafters have a hollow moulding on the edges, and at the apex there is a trefoil tracery between each rafter."

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PRACTICAL ENGINEERING AT THE CRYSTAL PALACE.

A SCHEME has been undertaken by the directors of the Crystal Palace, to enable students to obtain practical instruction in the rudiments of engineering and in the manipulation of materials. The classes are in connection with the Crystal Palace Company's School of Art, Science, and Literature, and Mr. J. W. Wilson, Asso. Inst. C.E., has accepted the post of Principal. The arrangements have been made with great liberality. The lower part of the South Tower has been portioned off for workshops, and by the time the classes commence—we believe on the 16th of next month—there will be every kind of machinery necessary to construct working engines from 3 to 6 horse-power from the designs of the students themselves. For the present three floors have been fitted up, and as the number of students is limited to fifty there will be plenty of room for them. It is intended to divide the course of one year into three terms of fifteen weeks each, the first of which will be devoted to mechanical drawing. For this purpose half of the second floor has been fitted up with twelve drawing tables, where, under the direction of Mr. Wilson, every part of the intended machine can be worked out on paper in its minutest detail. The second half of the second floor, which forms a separate room, contains half-a-dozen work-benches and a lathe for wood-turning, with independent steam power, to enable the student, in his second term, to make his own pattern in wood after he has finished the drawings. At the foot of the tower a shed is in course of completion, about 40ft. square, which will contain a furnace for melting, places for moulding and casting, and a smith's shop for forging the iron. As it is not intended to make larger machines than 4 horse-power, there will be plenty of room in this part of the building for the work which is to complete the second term. The first floor is fitted up with lathes, shaping and drilling machines, and is supplied with steam power from the main boiler of the Palace, so that no difficulty will be experienced in that respect. In this fitting shop the final stage will be gone through in fitting and erecting the engines, and doing repairs or other suitable work for the market. At the end of the three terms the student will have had the opportunity of constructing an engine from its earliest stage to its completion, and he will at the same time have learned how to get out quantities and estimates, and how to calculate the strength of materials. The workshops themselves leave nothing to be desired. An effective warming apparatus gives them an even temperature, and, as they are over 40ft. in diameter. surrounded with glass and lofty, they may themselves be considered models worthy of imitation. The third floor is arranged as a lecture room, where the Principal will give lectures twice aweek at four o'clock.

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THE PROPOSED CATHEDRAL FOR EDINBURGH.

THE following letter from a correspondent, signing himself "Fair Play," appears in the *Scotsman*:—

"In the *Scotsman* of the 11th inst. there was a paragraph to the effect that the trustees of the late Miss Walker had given instructions to Sir Gilbert Scott to improve his accepted design by the addition of two spires to one elevation, which would involve an additional cost of about £12,000.

This announcement would not have attracted more than passing notice under ordinary circumstances, but, as it is, it calls for comment for the following reasons:—1. Because there was a competition by six architects, chosen by the trustees, all of whom received certain conditions for the erection of a cathedral, which, briefly stated, was to be complete in every respect as regards the general design of such an edifice, to seat 1,500 people, and the cost not to exceed £65,000. 2. Because the public were invited to inspect and give their opinion of the designs submitted, as it was intended that the building should not only be worthy of the Episcopal Church, but of the city of Edinburgh, as a specimen of architecture and munificence.

With the decision arrived at by the trustees—viz., that Sir Gilbert Scott's design was, in their opinion, the best—it is impossible now to agree. It is almost inconceivable that there could have been any difficulty in making a choice between the design of Sir Gilbert Scott and Mr. Ross as was alleged. Sir Gilbert Scott's design had but one grand feature—the central tower—which was acknowledged by professional and unprofessional judges to be worthy of the name of Scott; otherwise it was meagre. Mr. Ross's design was, to use an unprofessional term, unique. It was upheld by the public and by the profession to which Mr. Ross belongs as being second to none of the competitive designs. There were grave doubts expressed, however, as to the possibility of carrying out the said design for the prescribed sum, which might have proved a stumbling-block to the acceptance of Mr. Ross's design, on the ground that it would be unfair to the other architects. The paragraph referred to puts any such conscientious scruples out of the question, for it would appear that there is no hesitation on the part of the trustees in making an advance of £12,000 over the £65,000. With the object for which this additional sum was allowed—viz., the erection of two spires, the public are at one with the trustees, for the obvious reason that the design they would have chosen ("Fidelitas") was conspicuous in having three spires. Sir Gilbert Scott was modest enough to claim for his design the title of a "parish church" only, and no doubt he was right; but it is easily seen how a parish church can be converted into a cathedral by a skilful architect who has not committed his labours to stone and lime. With all due deference to the trustees—have the other competitors been fairly dealt with? Why should Sir Gilbert Scott be allowed £77,000 for doing what the other architects were required to do for £65,000? The difference of cost would have materially improved any of the other designs, particularly Mr. Street's, which bore even a higher reputation than Sir Gilbert Scott's. There is much in a name, and it is not to be wondered at when human nature indulges occasionally in hero-worship, but the clear-headed people of Edinburgh might have had as great pleasure in pointing to their cathedral as being the work of a Scotchman, as in handing down the name of Sir Gilbert Scott, at a cost of £12,000, in connection with the same. Had either of the designs so severely condemned been selected, there would have been some excuse for the trustees (notwithstanding their want of judgment in the selection) improving them; but after making choice of what they deemed the best design, such a proceeding amounts to nothing less than injustice to the competitors and an insult to the public."

THE NEW WOOD PAVING.

IT becomes more and more doubtful whether the asphalte paving of various kinds now being so extensively tried in London will ever come into general use for roadways. For footpaths it seems eminently well adapted, but for roadways it is dangerous and costly, and very liable to wear out rapidly. This is especially the case in the Walworth-road and New Kent-road, where it is laid down in conjunction with the tramways, and where, in both roads, there are innumerable deep ruts and holes alongside the tram-rails, caused by the wheels of ordinary vehicles "hugging" the iron tram-rails and grinding to powder the asphalte. The prospects of asphalte as a road material being doubtful, therefore, it may be worth while to mention that in reference to the new wood paving, such as has recently been laid down in Gracechurch-street, King William-street, and a small portion of the Strand, Mr. Howell, surveyor to the S. James's Vestry, has reported as follows:—"The vestry, and London generally, has cause of great congratulation in the introduction of the wood paving laid in Gracechurch-street, and which will be found to result in a complete success, as it consists more in principle of construction than in mere material. Great ability and foresight have been shown in perfecting the scheme, and I shall be very much mistaken if it does not prove to be a solution of the difficulties of maintaining many important thoroughfares. The only drawback that first struck practical men was the difficulty that would result in connection with openings. I find that those difficulties would not be nearly so great as were anticipated, and I think it would not be out of place to suggest that some limit should be put upon the openings themselves, as I am personally convinced many of them are to answer a very trivial end. As the vestry have decided to study carefully the different kinds of new paving now being tested in London, it would be almost indelicate to attempt to bias any judgment in the matter, but, speaking as an individual, I am sure that a close study of the method of making and maintaining the pavement in question will go far to enlighten those who do it on this most difficult subject. We know the durability of wood, and when it is laid in the skilful manner as is now being done, it amounts almost to a guarantee of perfection. I hope that before another year has passed there will be some specimens in S. James's."

At the last meeting of the Commissioners of Sewers a memorial, most extensively signed by owners and drivers of cabs and omnibuses, was presented before the Board, praying for the substitution in the streets laid with asphalte of the "improved wood pavement," specimens of which have been laid down in the Strand and in King William-street, City. The grounds upon which the memorialists base their requests are that the wood pavement, while being equally noiseless, is not near so slippery and is far more durable, as proved by the result of the experiment in the Strand, where it has been laid for several months without the slightest sign of decay; asphalte, on the contrary, requiring to be constantly renewed.

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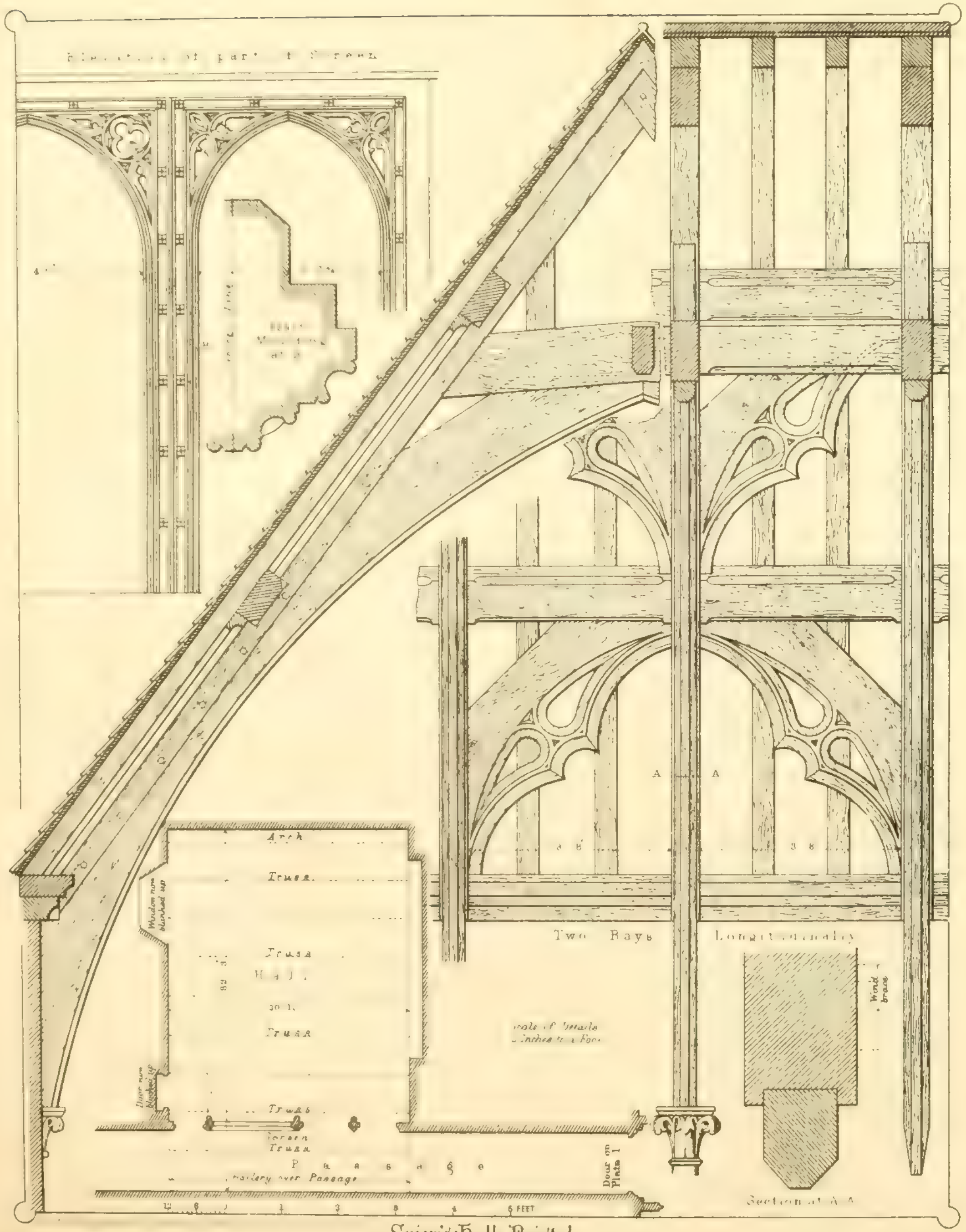
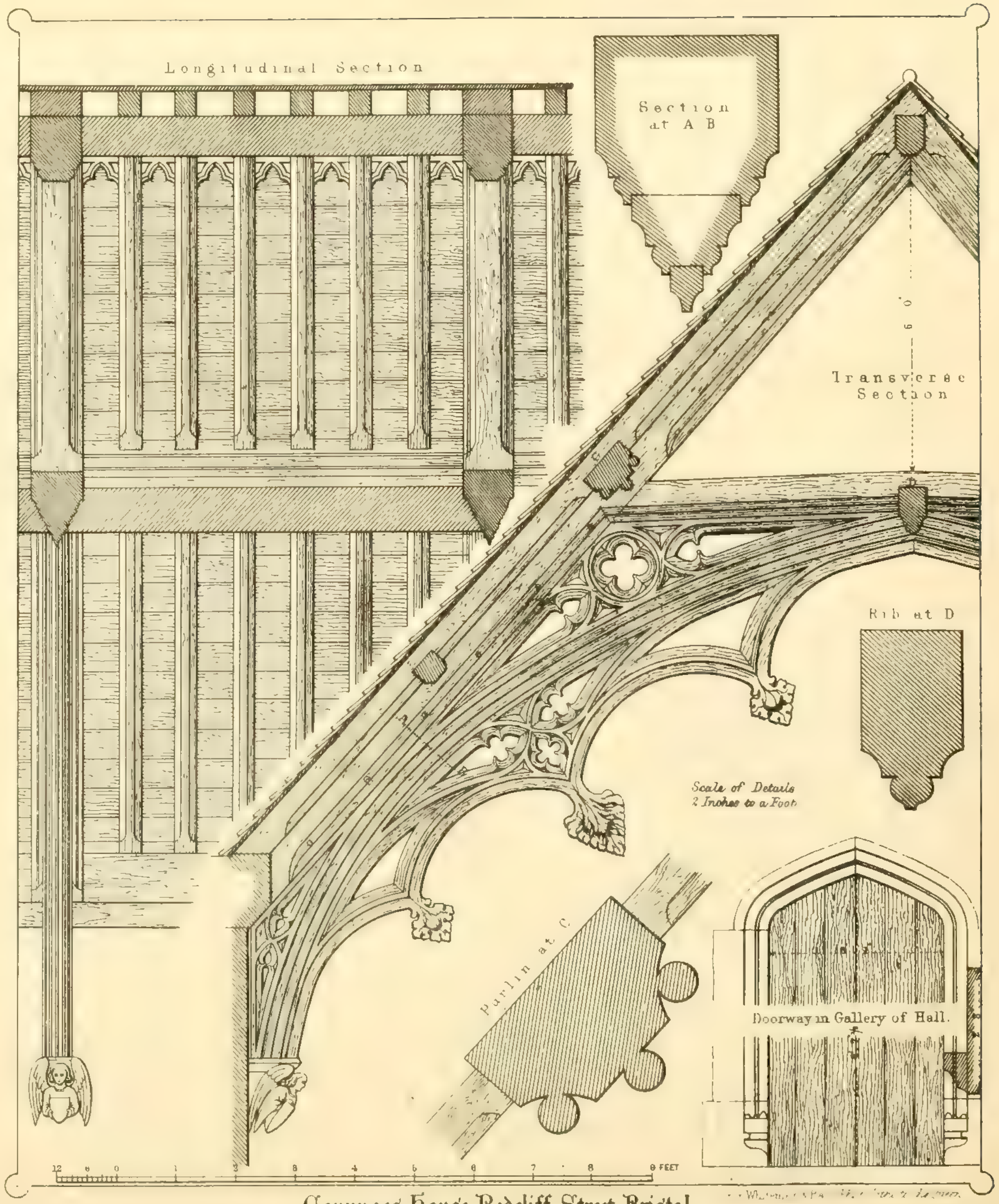
THE STONES OF THE GREAT PYRAMID.

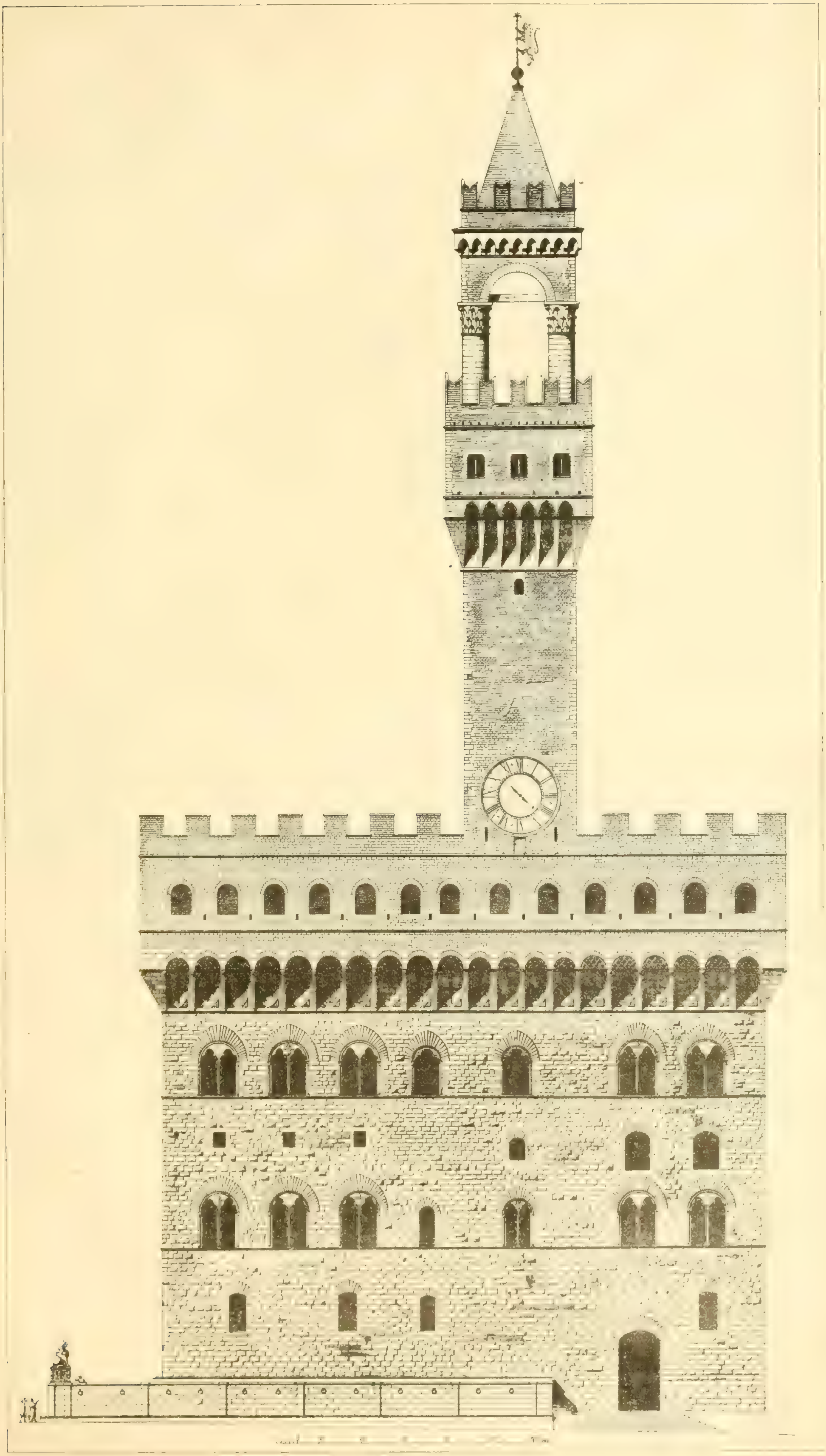
ACCORDING to Prof. Piazzi Smyth, the finest specimen of one of the "casing stones" of the great Pyramid known at present to exist, either in Europe or even in Egypt, was received in Edinburgh a few weeks ago from Mr. Waynman Dixon, a young engineer, who has recently completed an iron bridge across the Nile between Cairo and Ghizeh. The specimen possesses, Prof. Smyth says, in a more or less injured condition, five of the anciently-worked sides of the block, including the upper and lower horizontal surfaces, together with the levelled surface between. It was the exact angle of this levelled slope which led the late Mr. John Taylor to what Prof. Smyth calls "the immortal archæological truth, that the shape of the entire monument was carefully so adjusted and exactly fashioned in its own day to precisely such a figure that it does set forth the value of the mathematical term π, or does, vulgarly, demonstrate in the right way the true and practical squaring of the circle." Whether this be the case or no, Prof. Smyth declares that the length of the front foot of the stone, or that line or edge from which the angular π slope of the whole stone commences to rise, measures "within the limit of mensuration error now unavoidable, the number of just twenty-five pyramid inches, neither less nor more. And twenty-five pyramid inches have been shown to be the ten-millionth part of the length of the earth's semi-axis of rotation." Prof. Smyth is very severe on the Egyptologists of the British Museum for the manner in which they conduct their department.



Spicer's Hall, Bristol.
DETAILS OF ROOF OF HALL


Longitudinal Section
Section at A B
Transverse Section
Rib at D
Scale of Details 2 Inches to a Foot
Purlin at C
Doorway in Gallery of Hall.
12 6 0 1 2 3 4 5 6 7 8 9 FEET

Canynges House, Redcliff Street, Bristol
DETAILS OF ROOF OF HALL &c

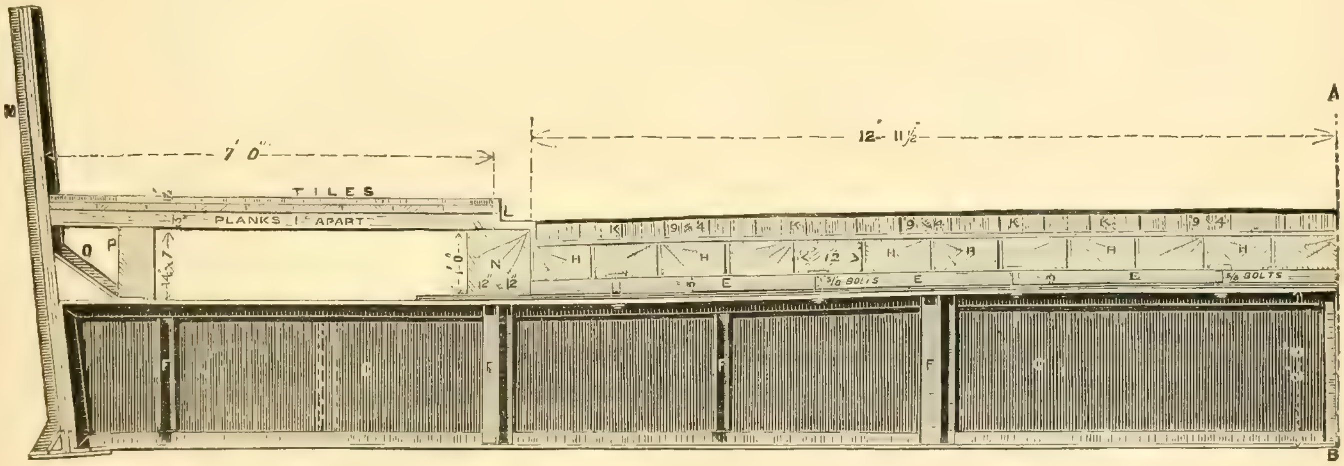


BRIDGE ROADWAYS.—VI.

In the present and concluding article on this subject, we intend making some general observations, and more particularly to call attention to the particular description of roadway adopted in the most recent specimen of construction over the river Thames. We have in our preceding articles given sufficient theoretical and practical reasons for the rule we have therein laid down, that the roadway should be accommodated to the bridge, and not the bridge to the roadway. It must be borne in mind that, supposing the character of the roadway to be adapted to the bridge rather than to the traffic, the latter suffers comparatively nothing to what the former would do were the conditions reversed. A slight alteration in a continuous length of road, even on the assumption that it is for the worse, is not of the same consequence as the adoption of a road which is unsuitable to the structure which supports it. In the one case, but a very small portion of the whole is affected, while in the other, it is not a part, but the whole which is immediately concerned. In the accompanying illustration is represented a cross section of half of the roadway of the new Albert Bridge, at Chelsea, which is rapidly approaching completion, and will be opened for traffic by New Years' Day. With the exception of the tiles which form the surface of the footpaths, the roadway is in every sense a timber one. It is, in fact, a complete wooden platform. As there are some peculiarities in the manner in which the different layers constituting the whole depth of the platform are arranged, we will describe them in detail. The Albert Bridge is designed on the improved suspension principle, patented some years ago by Mr. Ordish, and in accordance with that type of construction, presents the usual features of chains, main or side girders, cross girders, and platform. The side or main girders, a portion of one of which M is shown in the figure, are of the usual plate or solid type, and are made up of horizontal top and bottom flange plates and angle irons which connect them with the vertical side or web of the girder. There is one peculiarity to be remarked in these main girders which is not to be met with in any similar structure. They are placed not in a vertical position, but with a cant, as shown in the drawing, and are retained at the proper angle by the cross girders, which are riveted to them. At intervals the main girders are carried by the suspension chairs, to which they are connected by pins passing through the web, the junction being strengthened by circular wrought-iron gusset pieces and cast-iron bosses. This additional strength at the points in the main girders at which the connection with the chains is made is rendered indispensable by the severe shearing strain brought upon the web of the main girders. Theoretically, the total load on the bridge, including its own weight, is divided into as many parts as there are points of connection between the main girders and the chains. The separate weights, or the relative amount of the different subdivided loads, vary with the distances between the intervals of support, that is, with the distances between the successive pins. Another distinguishing characteristic of this bridge is, that the footpaths are placed inside the towers or pillars, and not outside, as in the case of the Chelsea Suspension Bridge and others.

The cross girders C in the drawing are of the same form of construction as their larger neighbours, and are stiffened vertically by tee and angle iron stiffening pieces, represented by F F in the Fig. The cross girders are rivetted at each end to the main girders, and are also connected through the medium of their top flange. The stiffening vertical angle iron D of the main girder M is bent or cranked while hot, and one end of it rivetted to the top flange of the cross girders. The advantage of this additional connection between the cross and the main girders is, that the strain upon the latter is not confined to a mere portion of the web and lower flange of the main girder, but is distributed well over the whole cross section of it. The cross girders are, moreover, connected together by horizontal diagonal cross bracing of plate and angle iron, so that the whole combination forms an iron gridiron of great strength, durability, and lightness. It is to be noticed that the depth of the cross girders is not uniform, but is greater in the centre than at the ends. It is by this varying depth in the cross girders that the rise and proper curve are given to the roadway. A more usual plan is to accomplish this by making a difference in the thickness of the road crust or surface, and maintain the cross girders uniform in depth. The former plan is preferable. In the first place, if the latter be adopted, the thickness of the roadway itself must either be in excess at the centre or the reverse towards the sides. It is a mistake to imagine, as is frequently done, that the greatest amount of wear and tear upon a road takes place at or near the crown. Upon the contrary, experience has proved, especially where the traffic is considerable, that a part of the road occupying an intermediate position between somewhere near the centre and the sides is the most severely tried. The most economical plan to adhere to with regard to the proper formation of the contours of the roadway of a bridge is manifestly to maintain the thickness of the road material itself uniform, and obtain the proper curve by varying the depth of the cross girders, road bearers, or whatever may immediately support the roadway, whether it be arched plates, corrugated iron, or other description of iron platform.

Passing on to the roadway proper, it will be seen on referring to the drawing that a plank E 3in. in thickness is bolted down, with bolts three-quarters of an inch in diameter, to the cross girders. Upon these planks are laid the half baulks H, 12in. by 6in., placed one inch apart. These extend over the whole platform of the bridge, and are covered by a complete "decking" of one-inch planks nailed down to them, which constitutes an especial feature of this bridge. Upon this decking the wooden sets of the roadway are spiked. The sets are 9in. by 4in., and are of two kinds, double and single. The double ones are laid every fourth row, and are the only ones which are spiked down. This spiking down is more than sufficient to keep the rows of single sets firmly in their places. A layer of asphalte completes the formation of the roadway, and serves to bind all the timber crust well together. The footpath is supported by two baulks, one, N, placed under the gutter L, and the other, P, close to the main girder. The gutter is of cast iron, of a simple angle shape, and acts both as a gutter for the drainage of the road as well as for the footpath. The fall in the footpath is obtained by making the two supporting baulks of different depths, one, N, which carries the gutter, having a depth of 12in., and the other, P, of 14in. To these baulks are spiked crossbars, 3in. in thickness, and nailed to them is a decking of 1in. planks, laid with an interval of 1in. between them. Upon the decking the tiles are placed forming the surface of the footpaths. These tiles are of the well-known description manufactured at the works of Messrs. Ransome, and are 1½in. in thickness. They are of a whitish tint, with the exception of the rows nearest the main girders and the gutter respectively, which are of a bright red colour. The whole of the timber is of the best Memel. If the experience of tiles at Westminster Bridge, as a material for forming the footpaths, be accepted as a criterion of their merit, one cannot well understand how any engineer could ever use them in a similar situation. The footpaths of Westminster Bridge at the present time are nothing more than a series of holes filled with water, complete little pools, in fact, from which, moreover, there is no escape for the unfortunate pedestrian. It is impossible to deny that the footpath which offers the greatest security against unequal subsidence, and the consequent forming of pools in wet weather, is one which is, so to speak, all in one piece. It may be safely asserted that the greater the number of individual pieces, each of which can sink and become disturbed, independently of its neighbours, of which a footpath is composed, the greater the chance of the footpath becoming in the condition presented by those of Westminster Bridge. In this respect, flags, although bad enough where improperly laid, are superior to tiles. It may be noticed that, with respect to Westminster Bridge, the footpaths drain into gutters of their own, situated next the parapets of the bridges, and, consequently, the fall is not sufficient. Obviously, the fall proper for a large footpath could not be given when the gutter is situated next to the para-



pets, as the tendency of any pushing or crowding would be directly to hurl the people over the parapet into the river beneath. There are only two materials which fulfil perfectly the conditions requisite for a good footpath. They are asphalte and concrete, and may be considered almost as one. The order we should observe, in the classification of materials, would be—asphalte or concrete first, flags second, good gravel next, and tiles last of all.

SUGGESTIONS, WISE AND OTHERWISE, UPON THE SUBJECT OF FIRE PREVENTION.

UNDER the heading, "Suggestions and Opinions of Scientists," the *New York Herald* publishes, Nov. 21, a communication from Benjamin Noyes, late Commissioner of Fire Insurance, in which he attributes the rapid and uncontrollable spread of the fire in Chicago and Boston, more especially in the latter conflagration, to the escape of gas from melted or broken gas-pipes; also, a communication from Mr. Joshua Kidd, in which he takes the ground that the products of combustion from the boilers of steam fire-engines might be mingled with the exhaust steam, and advantageously applied to the extinguishment of fires; also, communications from George M. Van Nort, Commissioner of Public Works, one from Edward H. Tracey, Chief Engineer, and one from John I. Serrell, Consulting Engineer, in which the three latter gentlemen express a most decided opinion, backed up by what seem to us the soundest reasons, against the proposed scheme of re-enforcing the water supply of New York City by water pumped and forced from the North River. An American paper comments on these suggestions as follows:—

That gas may in some instances originate a fire by an explosion is undoubted; but that in any marked degree it contributes to the general spread of great fires is not at all consistent with the conditions of the case. The common illuminating gas is not a supporter of combustion like oxygen, but simply fuel which develops in burning a definite amount of heat for a given weight. If it be mingled in certain proportions, either with atmospheric air or with pure oxygen, the mixture is highly explosive; but, if the mingling and combustion are constant and simultaneous, the result is a steady combustion, as in the oxy-hydrogen blowpipe or the ordinary gas-burner. Of course, when pipes are melted off by the direct action of fire, the gas must be ignited by the fire at the instant of escape, and consequently the effect is that of a large burning jet, and not an explosion. Instances may arise, however, where pipes are ruptured by falling walls, or where lead pipes are melted off by heat communicated through walls, without the direct contact of fire or heat sufficiently intense to cause ignition, in which case the escaping gas mingles with the air, and forms a compound which explodes whenever the fire reaches it. But these cases are the effect of the spread of the conflagration, and cannot be, except under very rare conditions, a cause for it. It is, then, in the quality and quantity of gas as fuel, if at all, that it assists in the spread of conflagrations, and this, as can be easily computed, cannot by any flow possible through ordinary gas-pipes add very materially to the heat otherwise generated by the conflagration. We are compelled to look upon statements such as we find in the communication of Mr. Noyes, that "the Chicago fire was to a certain extent a gas-fire," and that "the fire in Boston was, in fact, a gas-fire after the first beginning," as based upon the assertions of observers who either observed inaccurately or who recount sensationally what they saw.

In Mr. Kidd's proposition to smother fires by the use of steam mingled with non-combustion-supporting gases, although the communication shows some research and thought upon the subject, there are insuperable difficulties. Water operates in two ways to quench fire:—First, it excludes the air by forming a coating over the surface of the burning mass, which prevents contact with the atmosphere until the coating is evaporated, and it also excludes the air by the volume of steam generated. Second, by rapid evaporation, the water thrown upon fire carries off the heat from the burning material.

A fire may be temporarily smothered out by means of water; but, if there be heat enough remaining to evaporate the water, and above this a surplus of heat sufficient to cause combination with the oxygen of the air, combustion will be renewed so soon as the water is evaporated.

It is this last important function of cooling by evaporation in which the great efficiency of water as a permanent and complete extinguisher consists. Smothering alone merely suspends combustion, which will be renewed the instant the air has access to the heated mass. Suppose, to illustrate, that it were possible to completely fill a burning building with non-combustible gas and steam so as to entirely exclude the air, and to keep it so filled for any desirable length of time, combustion would be, of course, instantly arrested. But without the application of water it would be long before the mass would be so cooled as not to commence burning again as soon as contact with air should supply the necessary oxygen. To speak figuratively, the fire giant, when once fully developed, cannot be asphyxiated. Choke him as much as we may, strangulation only suspends animation, and the instant we release his throat he springs up as vigorous as ever. He is only dead when he is cold.

But, aside from the preceding considerations, what, practically, are the exhaust steam and the products of combustion of a thousand fire-engines and boilers compared with the products of combustion in the conflagration itself, and the steam generated by the water thrown upon it?

From these considerations, it seems that fire can be combated by smothering or excluding the air only at the outset, and before it reaches any great proportions. Granting the paramount importance of keeping the fire at its origin confined from the air in the room where it originates as long as possible, and admitting the undisputed utility of fire-extinguishers and like devices, we shall still have to rely upon water as Nature's great weapon to combat fire, and cooling by evaporation as the great element in its operation, not only for extinguishment, but for prevention.

NEW THEATRE, ABERDEEN.

THIS building, erected from the designs and under the superintendence of Mr. C. J. Phipps, F.S.A., of London, was opened on Thursday week. The project was only started in the commencement of the present year, chiefly through the instrumentality of Captain Stevenson, of Viewfield, and several other influential gentlemen, who formed a limited company, the shares of which were so good and so liberally taken up that in May last contracts were entered into with the following tradesmen:—

Mason work—Messrs. Peter Bisset & Son, Aberdeen.

Concrete work—Messrs. Drake & Co., London.

Carpenter work—Messrs. Warrack and Daniel, Aberdeen.

Iron work—Messrs. James Garvie & Co., Aberdeen.

Plumber work—Mr. Alexander Lamb, Aberdeen.

Slater work—Mr. George Davidson, Aberdeen.

Plaster work—Mr. James Morrison, Aberdeen.

Glazier and painter work—Mr. Alexander Stephen, Aberdeen.

Gas-fitting work—Mr. Thomson's trustees, Aberdeen.

The total amount of these contracts was upwards of £6,000, and the sums for decorations, special gas-work sun-burners, furnishing, and fittings, will make the total cost about £8,000.

The New Theatre occupies a site between Guild-street and Trinity-street, and is close to the South Parish School. The building is of a mixed Gothic character, and the front may be said to be generally built of granite and freestone. The ashlar work is of blue Rubislaw granite, and the dressings of white Kemnay granite and red Turriff sandstone. The capitals and string courses are composed of Newton freestone, and the fillings-in of the window arches are composed of Pether's patent ornamental bricks, which in this case are of a yellow colour. The columns, which are six in number, and which are a very handsome feature of the entrances, are of polished Peterhead granite, and have been made by Messrs. Macdonald, Field, & Co. Attached to the main building, and extending towards the railway, is a wing which contains the dressing rooms, green room, band room, refreshment rooms, having on the ground floor a shop, and the entrance to the gallery. There are also separate entrances to the pit, boxes, balcony, and private boxes, there being in addition a large shop, with extensive cellarage, in the centre of the main building. Apart from the front, the other walls of the building have been constructed of concrete by Drake's patent apparatus. Many of the other requisites of the building, such as the gallery staircase, &c., have been formed of this material, the wearing power of which is quite equal to our hardest granite. This, we are informed, is the largest building of the kind in which concrete has been used.

The whole of the entrances are well lighted, and the access is all that could be desired. As we have said, the staircase to the gallery is of concrete, and the other staircases are in wainscot oak. In the case of the balcony and private boxes, the staircase leads to a crush room, in which are ladies' retiring rooms, hat and cloak rooms, &c. A lobby also leads into a commodious refreshment-room, solely set apart for the occupants of the balcony and the private boxes. From the crush room, corridors lead to each side of the house, the proscenium boxes being communicated with by circular staircases from the balcony. The balcony is provided with Mr. Phipps's chairs, which are made so as to turn up to give free access along each row of seats. The chairs are covered with handsome crimson cloth. The ordinary boxes are reached by a separate staircase, and this part of the house is also supplied with a refreshment-room. The front seats of the gallery are to be devoted to an amphitheatre.

The stage and its appliances have been constructed in the most modern and scientific manner, Mr. T. Rhodes, London, having had the active charge of this part of the work. The stage is 54ft. wide; the proscenium is 28ft. in width. The act drop is a painting of the well-known "Silver Strand" of Loch Katrine, having an ornamental border, and was painted by Mr. George Gordon, scenic artist, London.

As to the interior of the building, we may state that the theatre is seated for 1,650, while there is accommodation for well up to 1,800. The gallery is seated for 700, the pit for 550, the boxes for 240, the balcony for 100, and the private boxes from 8 to 10 each; and it is stated that great pains have been taken, so that good views of the stage are to be had in every part of it, and that the gallery and the pit have been made with a slope sufficient to enable the occupants of each tier of seats to see easily over the heads of those in front of them. Further, we may mention, in regard to the decorations, that they are generally of a Greek and Romanesque character. Several of the combinations of ornament are very elaborate, and the effect, as a whole, is exceedingly good. The prevailing colour of the decorations appears to be blue upon a dark cream coloured ground, while the draperies and chairs are of crimson. The walls of the pit, boxes, and gallery are covered with a handsome paper, having a gilt and red design upon an unobtrusive sage green ground. The balcony, which has three rows of seats, behind which is an upper circle of six rows, projects over the pit, and the gallery runs over the balcony to the front. The balcony front is an open trellis work of elaborate design, very richly gilt, and the lines of the balcony and gallery are continued upwards, and form one continuous circle round the ceiling. The cornice is beautifully moulded, and decorated in gold and colours, and the ceiling itself is divided into eight semi-circular compartments, having a sun-light in the centre. There are three private boxes on each side of the stage, two on the balcony tier, and one on the pit level. These are divided by triplet columns, effectively decorated, and terminating with carved capitals. The proscenium is arched over, and there are also arches over the private boxes, the lunettes being filled with scenes from Scott's "Lay of the Last Minstrel," "Marmion," "The Lady of the Lake," and "The Lord of the Isles." Altogether, the building is most comfortably fitted up, and we are quite safe in saying that there is not a more handsome or better finished theatre in Scotland; indeed, we may state that it is one of the best of the many theatres that Mr. Phipps has constructed. Mr. Phipps himself, during the last week, superintended the finishing of the work. Mr. Browne, of London, was clerk of the works.

S. GILES'S CHURCH, DURHAM.

IT having been proposed to partially or entirely demolish St. Giles's Church, Durham, the Architectural and Archæological Society of Durham and Northumberland, in October last, appointed a select committee, with instructions carefully to examine and report upon the building, historically and architecturally, and to suggest a plan by which, with the least possible destruction of the existing fabric, the required increase of accommodation could be most effectually provided. The report of the committee so appointed has been issued, and from it we learn many interesting particulars of the history of the structure. The architecture of the church belongs to four periods: The Early Norman of Bishop Flambard; the Late Norman of Bishop Pudsey; the Early English period; and the Perpendicular of Bishop Langley. There can be no doubt that the existing nave is, at any rate in respect of its chief features, that built and dedicated by Flambard in 1112. The existing remains comprise the north, south, and part of the west walls, which are all of rough rubble work, seemingly without basement, stringcourse, or moulding. It is not clear whether the lower part of the tower is due to Pudsey or not, nor can the fact be satisfactorily determined till its arch and supports, now built up and hidden by a wall and gallery, are opened out. Though undoubtedly early, the angle buttresses which constitute the only other strictly architectural features, seem rather to belong to a somewhat later period—the commencement of the thirteenth century. With this possible exception, the church seems to have continued much as Pudsey left it. Nothing can be more dreary than the present aspect of the church. Neglect, bad taste, and mutilation have destroyed much of its pristine character. In reply to the question—"Can the church be put into a thoroughly sound and efficient state, and, while retaining its chief features and interest, be so enlarged as to double the extent of its accommodation?" the Committee proceed to show that it can both be so restored, and also enlarged to the extent required, artistically and strictly after ancient precedents. The whole of the chancel, tower, and the greater part of the north wall of the nave, appear to be in a sound and good condition; these, therefore, should carefully be preserved, and the slight structural defects in them made good. The destroyed chancel arch should be rebuilt. In the nave, a portion of the north wall towards the east seems to have been broken into and roughly rebuilt at some former period; it should be made uniform with the rest; or, perhaps, a small aisle, affording accommodation for sixty children, might here be thrown out northwards, with an adjoining vestry to the east of it. Flambard's two windows on the north side of the nave should be opened out and glazed, the present doorway removed, and a porch constructed. The tower arch should be thrown open, the vestry cleared away, and the west window disencumbered of plaster and reglazed. The north side of the church is in sounder condition, and contains more features of interest than the south side; extension of the fabric could, therefore, be carried out with the best and happiest effect on the south side, whose one original feature remaining is the doorway. Here the capacity of the church might be increased indefinitely, with no further interference than the removal of one of the walls, by throwing out a single broad aisle or lateral nave, subordinate to the existing one in height, but equalling or exceeding it in breadth, as might be found needful. Good precedents are cited in support of this recommendation.

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LAND AND BUILDING SOCIETIES.

Dunblane Building Company (Limited).—A general meeting of this company was held last week, when a dividend of 5 per cent. was declared.

Hanley.—The Staffordshire Potteries Economic Permanent Building Society held its eighteenth annual meeting on the 4th inst., at the Town Hall, Hanley. The manager read the yearly report and balance-sheet, which was unanimously adopted. The society has had a great accession of new members during the past year, by which it is in a position to advance sums from £50 to £2,000 on mortgages. The most remarkable circumstance connected with this very prosperous society is that it has never made a single loss since its establishment, and has been paying its members a compound interest of 7½ per cent.

Mercantile and General Permanent Building Society.—This society held its seventh annual meeting on the 16th inst. The report presented by the secretary, Mr. J. H. Ginder, stated that the receipts for the year 1872 amounted to £10,050 1s. 10d., which included £1,925 1s. 1d. for repayments of principal and interest on advances made to borrowing members, and deposits to the amount of £905 1s. The amount advanced to members was £3,050, making a total sum of £21,837 10s. advanced since the formation of the society. The profit for the year was £1,071 10s. 3d., which, with £251 0s. 7d., the balance brought forward, made £1,325 10s. 10d. Out of this the expenses of management had been allowed and the members had been credited with the usual interest of 5 per cent., which absorbed £337 13s. 11d. and a bonus of 2 per cent., making a total dividend of 7 per cent. was declared, leaving a balance to be carried forward.

Saltburn-by-the-Sea.—The first annual meeting of the members of the Saltburn, Skelton, and Lofthouse District Terminating Benefit Building Society was held in the Ruby-street Hall, Saltburn, on Tuesday week. From the statement of accounts and the report, we gather that 648 shares, equal to £38,000, having been taken up during the year, 88 shares have been sold at premiums amounting to £648 3s. 4d., and advances had been made on 66½ to the extent of £3,990. The amount of profit actually realised is 2s. 3d. per share of £60, and the prospective profit is £1 per share. The accounts and report were unanimously adopted, and officers were elected for the ensuing year. Six shares were also sold at an average premium of £7 15s. per £60 share.

Civil Engineering.

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New Bridge at Peterborough.—A new bridge over the Nene at Peterborough has been opened. The design was prepared by the County Surveyor, in conjunction with Mr. Fowler, of London. The tender of Messrs. Handyside & Co., Derby, for £5,426, for the construction of the bridge, was accepted, the contract with that firm being entered into at Midsummer, 1871. The architectural character of the bridge is of a comparatively modified type, necessarily so because of the pecuniary limits fixed by the two counties. It is a wrought-iron girder bridge, about 150ft. in length, and 30ft. in width, clear of parapets. It has three openings, the central opening being 75ft. in width, having a clear water-way from the ordinary water height of 9ft. 5in., and the two side openings are 37ft. 6in. in width. It is supported by four wrought-iron cylinders, which form four pillars with moulded caps. These cylinders are filled with concrete, go down some 16ft. beneath the ordinary water-level, and stand upon the rock. They are 5ft. in diameter. The roadway is pitched with granite squares, resting on a bed of concrete. There is a footpath on either side paved with Yorkshire paving. These are within the parapets, and are supported by ornamental cantilevers attached to the main longitudinal girders. The parapets, which are ornamental, are terminated by eight stone piers, four on each sides, the piers having a pinnacled termination. The four central piers, which rise out of the four cylindrical supports, are to be surmounted by gas lamps. Approximate list of the quantities of materials employed in the bridge:—Ironwork, 165 tons; diggings, 771 cubic yards; concrete, 1,450 ditto; brickwork, 1,180 ditto; stone curb, 12 by 6, 1,084ft. run; York landings, 2½ thick, 3,772 square feet; granite cubes for roadway, 5,440 ditto; stone in piers, copings, bed-stones, &c., 2,186 cubic feet. On the panels of the cast-iron piers of parapets are to be placed the arms of the Lord-Lieutenants of the two counties. It has been decided to place the arms of the late Lord Southampton on the Northamptonshire side, as it was during his Lord-Lieutenancy the work was entered upon. The arms of the city of Peterborough are to be carved on the panels of the stone piers at the Peterborough end.

Wandsworth Bridge.—The long-felt want of a bridge across the Thames between those of Battersea and Putney—a stretch of two miles and a half—is now in a fair way of being supplied, substantial progress having of late been made with the works of the Wandsworth Bridge. The bridge was commenced in September, 1871; when completed it will directly connect the districts of Wandsworth and Fulham. The bridge is divided into five spans, one at each end of 113ft. 6in., and three in the stream of 133ft. 4in. each. The river piers consist of wrought-iron cylinders 7ft. 6in. in diameter; they were lined with concrete for a thickness of 2ft. during construction, and were afterwards filled in with that material. Two of these cylinders form a pier, being connected together transversely immediately under the platform of the bridge. The whole of the piers have been sunk into the London clay, and the cylinders have been carried up to the proper level ready to receive the girders, the bedstones and bearing plates being all in place. The abutment piers on either side of river are of brickwork and masonry. There will a clear headway of 20ft. above Trinity high-water level at the centre of the bridge, the height being reduced to 14ft. at the abutments. When the work of sinking the cylinders commenced, an air chamber connected with pneumatic apparatus was employed. It was, however, subsequently abandoned under the advice of Mr. Nicholls, the resident engineer of the bridge, in favour of divers, who worked inside the cylinders, clearing away the soil at the bottom. The cylinders, being fitted with cutting rings and lined with concrete, were thus readily sunk, and in a more simple manner than by the pneumatic arrangement. In all cases the cylinders have been sunk to a depth of 14ft. into the clay, and have had a thick bed of concrete put in under them. The main girders of the bridge are of the lattice pattern, 12ft. deep, and connected at the ends so as to be continuous throughout. Over each pier will be an ornamental pedestal, carrying a cluster of three lamps. The ornamental cast-iron brackets which were to have filled in the angles formed by the undersides of the main girders, and the piers will not be used, their place being supplied by a foliated cap, which will be placed at the head of each column, and which will otherwise relieve the plainness of the structure. The main girders, which have a slight camber, are connected by cross girders placed 4ft. apart throughout the whole length of the bridge, the cross girders, being riveted on to the upper side of the bottom flanges of the main girders. Upon the tops of the cross girders 6-in. timbers will be laid diagonally, and over these will come a longitudinal decking, upon which the macadamised roadway and the paving will be laid. The width between the main girders is 30ft., of which 18ft. will be occupied by the roadway, and 12ft. by two footways of 6ft. each. At the present time the first span on the Surrey side of the river is complete, with the exception of some of the cross girders, and the first girder of the pair for the second span is nearly ready to be moved into position. The main girders are built up on a timber platform parallel with the line of the bridge, and when finished a portion of the platform at each end is removed, and two lighters, each fitted with raised stagings, are floated under the ends of the girder. As the tide rises the girder is lifted, and is then floated into position and placed on its bearing upon the piers. The approaches on the Surrey side consist of five brick arches of 20ft. span each, and another span of 20ft. carried by girders over a roadway. Beyond this the approach is carried for a distance of 280ft. in solid bank. The greater portion of this work is completed. On the Middlesex side there are 420ft. of approach road all in embankment, and a brick arch of 30ft. span adjoining the bridge. The bridge is being erected from the designs of its engineer, Mr. J. H. Tolmé, by Messrs. De Bergue and Co., as contractors, under the superintendence of their engineer, Mr. Mallalieu, the contractor for the approaches being Mr. Bull, of Southampton.

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SCHOOLS OF ART.

South Kensington.—The annual distribution of prizes to the students of the South Kensington School of Art took place on Thursday week. Mr. Richard Burchett, the head master, read the report, which stated that at the second grade examination by written papers in geometry and perspective, and exercises in free-hand and model drawing, which took place in March last, 104 students "passed," 41 obtained prizes, and 18 won admission to the schools at half fee by obtaining certificates of the second grade. At the third or highest grade examination 18 students obtained teachers' certificates, and since the last distribution of prizes 10 students had been recommended from these schools for admission to the Royal Academy. After stating that in addition to the regular prizes of the school others had been offered for competition by manufacturers for designs for plaster, for porcelain, &c., the report went on to show that the past competitions had led to practical results, inasmuch as excelling pupils had received remunerative commissions from West-end dealers in objects of fine art. The same document further stated that since the conditions of admission to the school had been revised in July, 1871, granting free studentship, there had been a falling off in the number of students and the amount of fees paid by them for the year ending July, 1872. The total number of students was 765, and the amount of fees was £2,220 11s. Of this number there were 421 males and 349 females; 195 were free students, and at the present time there were in the school 32 students in training, 5 of whom were females, and 14 national scholars who were being educated as designers. The gold medal was awarded to Miss Marianne Mansell for designs for lace. This lady also won a silver medal for a design of a toilet cover. The silver medals were won by Misses Maria Brooks, Isabella Camp, Matilda Goodman, Ellen Montalba, Emma C. Simpson, and Mary S. Wilson, and the the Queen's prizes were taken by the Marchioness of Queensberry for a model of a head from life; Misses Edith Julia Cowper, Grace Cruickshank, Harriette Cookes, Julia d'Adhémar, Margaret Mëyer, Matilda Goodman, Harriette Montalba, and Lucy F. Sothern. To the male students the principal awards were made to Mr. Owen Gibbons, who took the gold medal for a modelled design for a shield; and Messrs. W. W. Oliver, W. R. Randall, J. J. Shaw, and T. W. Wilson each received a silver medal. Messrs. G. Payne and E. G. Reuter were awarded bronze medals. The Queen's prizes were taken by Messrs. J. Bool, B. E. Bradwyn, G. D. Drummond, T. E. Gaunt, J. E. Lush, A. J. T. Pattison, A. J. Watkins, and J. Wormleighton.

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The Wesleyan Reform Chapel, in Brougham-street, Middlesbrough, has lately been reopened, after being entirely remodelled from plans prepared by Messrs. Hunter & Carr, architects, of Middlesbrough.

The Metropolitan Board of Works has consented to contribute £723 (being half the cost) towards the purchase of houses in East-street, Hoxton, about to be removed for the purpose of improving the entrance to the High-street.

Building Intelligence.

CHURCHES AND CHAPELS.

Altrincham.—A new Unitarian Chapel was opened at Altrincham on Wednesday week. It has been erected by Mr. J. P. Cardwell, of Altrincham, from the designs of Mr. Thomas Worthington, of Manchester. The interior consists of a nave 57ft. long, and one aisle to the north, separated from it by five arches with granite shafts, making a total width of 37ft. The east end is apsidal. The exterior of the building is plain but substantial, being faced with brick, and stone dressings round the entrance doorway and windows, the heads of which are filled with geometric tracery. The west end has two gables, and the roof is carried round the east end, having a large gilt cross at the apex of the apse. The chapel is fitted with pitch pine seats for about 225 adults and 40 children. Five handsome gas coronæ, suspended from the roof, are the work of Messrs T. Thomason & Co. of Birmingham. The cost of the whole has been somewhere about £3,000.

High Toynton.—The parish church of High Toynton was reopened after restoration on the 12th inst. The church has a nave 43ft. by 20ft., and a chancel 16ft. 9in. by 16ft. 10in., with vestry on north side of same. There is a tower, with an octagonal slated spire, at the south-west angle, the lower story forming the porch. Sittings are provided for 100 persons. The interior walls and the space between the rafters of the roof are plastered. The windows are glazed with tinted glass, except where some modern coloured glass from the former church has been introduced. For the south, east, and west windows stained-glass memorial lights have been designed. The designs were prepared by E. Christian, Esq., of London; and Mr. Young, of Lincoln, has carried out the work.

Leamington.—It has been decided to procure tenders for the immediate erection of the nave and transepts of a new church to be dedicated to S. Paul; the chancel to follow as soon as the funds will admit. The church is intended to accommodate 1,000 persons, and has been designed by Mr. J. Cundall, architect, of Leamington.

S. Mark's Church, Lewisham.—A reredos of Caen stone has been erected in this church, the design of which comprises a centre portion of three chastely-moulded arcades, embracing the width of the altar-table, and pinnacled supports, richly crocketted, on either side, containing four niches for the reception of figures of the Evangelists, which it is proposed to carve in statuary marble, and insert when the funds permit. The middle compartment of the arcade is deeply recessed, and a statuary calvary cross on a gold ground placed therein, and above it is erected a light and elegant tabernacle canopy, supported on four polished Peterhead shafts, with the angels Michael and Gabriel supported on pinnacles on either side. In the panels of the side compartments are carved, on a richly-diapered ground, the symbols of the Agnus Dei and the Pelican, and in the spandrels, the Dove and the Alpha and Omega. The whole is profusely carved, and has been carefully studied throughout with a view to its emblematical teaching. The whole of the work has been executed by Mr. George Whittingham, of Edward-street, Kennington Park-road, and designed by the architect of the building, Mr. William C. Banks, of Gracechurch-street, who also had designed the scheme for filling the whole of the traceried windows with stained glass. The centre portion of the reredos was the munificent gift of — Lonsdale, Esq.

BUILDINGS.

Aberdeen.—A new theatre, called Her Majesty's Opera House, has been opened at Aberdeen, under the management of Mr. Gomersal, late lessee of the Sheffield Theatre. In size the theatre is about as large as the Gaiety, which it somewhat resembles, though not so lofty, it having one tier less, and in that respect assimilates more to the arrangement of the Vaudeville. The architect is Mr. C. J. Phipps, F.S.A., of London; and the Aberdeen papers speak in the highest terms of the way the whole undertaking has been carried through by him. The theatre will hold about 1,700 persons.

Camberwell.—The new Vestry Hall at Camberwell, of which Mr. E. Power is the architect, is approaching completion. At the last meeting of the Camberwell Vestry it was resolved: That the nine office doors, right and left of the corridor, be panelled with one sheet of ground plate glass each, at an extra cost of £15. That the architect be authorised to obtain tenders for iron gas tubing and speaking tubes. That the Vestry Hall, two committee rooms, staircase, corridor, and entrance hall be heated with hot-water pipes, at a cost not exceeding £300. That the alternative estimate No. 2, for executing in Keen's cement the whole of the plasterer's work, be adopted only to a height not exceeding 4ft., thus effecting at least a saving on the contract sum. That the recommendation of the architect, to spend an additional sum of £200 beyond the present contracts, be granted for completing the ornamental decorations of the interior of the Vestry Hall, according to the designs submitted to the committee.

Cleveland.—A branch of the National Provincial Bank has just been completed at Cleveland, from the designs of Mr. John Gibson, the architect to the Bank. The new building is Classic in style, and the masonry is of Stainton freestone of a good colour. The principal room is 66ft. 6in. by 29ft. 6in., and the height is 20ft., and is lighted by fourteen windows and three twenty-eight jet sunlights. The floor is laid with Minton's tiles. A lift communicates with the strong rooms below, the latter being fireproof, and fitted with skeleton iron shelves, &c., by Messrs. Chubb. By an ingenious contrivance the closing of the door of the principal strong room shuts off the gas. The ventilation of the building has been carried out by Mr. W. W. Phipson, C.E. The contractors were Messrs. Potter & Wilson, and Mr. William Glover was clerk of works.

SCHOOLS.

Driffield.—At the ordinary meeting of the Driffield School Board, held on Thursday week, the seal of the Board was ordered to be affixed to the contract for the erection of the new schools, and the date for the completion of the work was extended to the 1st October, instead of the 1st of July, as originally fixed, in consequence of the time which had since elapsed. The contractors are Messrs. Hewson Brothers. Messrs Hayton & Sons' tender for supplying the heating apparatus for warming the schools, for £195, was accepted.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

All Letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line, of eight words (the first line counting as two). Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 9d. per line.

Advertisements for "Situations Wanted" are inserted at a charge of one shilling for the first twenty-four words, and sixpence for every succeeding eight words.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Cases for binding the half-yearly volumes, 2s. each.

NOTICE.

It is intended to issue in future, in the First Week of Each Quarter, a "Large Number" of the Building News, with a guaranteed circulation of

Twenty Thousand Copies.

Copies of these numbers will be forwarded to every Architect, Engineer, Builder, Contractor, and Surveyor in the United Kingdom, and to all in America, India, and the Colonies whose addresses can be obtained.

Space will be reserved for a limited number of Extra Advertisements, the charge for which will be as follows:

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Small Advertisements One Shilling per line.

Special arrangements may be made for a series of insertions.

The First Quarterly Large Number will be issued on January 3, 1873, and all advertisements intended for insertion therein should at once be forwarded.

Received.—J. U. L.—J. G.—H. & F. B.—C. J. S.—J. E.—J. C.—B. G.—W. P. B.—T. W. G.—Arch. B.—R. C. M.—J. O.—C. H. T.—The Derwent Foundry Company.—W. H. L.—G. E. S.—J. F. & Sons.

Surveyor.—We don't know.

"Solomon Setsquare" next week.

James Robinson (Durham).—All we can do now is to promise that the Title page Competition will be proceeded with in time for the successful design to appear with the index of the *next* volume of the Building News.

J. W. S.—Drawings intended for photo.-lithography (originals or tracings), made especially for reproduction by this process, should have well-defined black lines, and should not be shaded with Indian-ink, or tinted with flat washes. Colours should be avoided; smooth paper should be used; the drawing should be about twice the size of the intended lithograph, as the lines thin and sharpen by reduction. For materials for concrete see back numbers of the Building News.

Correspondence.

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GRANITE AND MARBLE.

To the Editor of the Building News.

Sir,—I have not the slightest interest in proving that granite is a better or cheaper building material than marble. My only object in discussing this subject with "E. G." is to get at the truth. The discovery of a perfectly fire-proof material will be invaluable. He contradicts my assertion that the average cost of marble is ten times greater than granite; but all the pooof he gives is that "he is certain of it." I beg to refer him to Laxton's "Builders' Price Book for 1872." At page 119 he will find that granite is quoted at 5s. 3d. per cubic foot, and at page 122 that the several varieties of marble range from 12s. to 90s. per cubic foot. Thus the lowest price is more than double that of granite—the highest sixteen times greater.

Further on, "E. G." says "it is impossible to work granite at all in such forms as modern necessities require, and refers, for example, to the capitals of S. George's Hall, Liverpool, and goes on to say that as our American brethren do not find "marble so costly, I am quite sure, as a practical man, that our business men in London will not refuse to bear the extra expense, if any." Now, if my correspondent had read my letter carefully, he would have remembered that I expressly excluded such buildings as he refers to, as, in my opinion, unsuitable for granite, and I endeavoured to show that its economical use depended mainly, if not entirely, on the style of architecture and of construction adopted. I am very glad that our American cousins can build with marble, and not find it "so costly," but with the prices I have quoted, it is clear that we cannot, and as to "our business men in London," my experience has always been that it is generally difficult to get them to agree to any extra expenditure for improvements on the ordinary way of doing things.

In conclusion, I have a proposal to make to "E. G." I am still sceptical, if not incredulous, about this American marble. I think there must be some mistake, for I find his "eye-witness," after the fire at Boston, tells us in one and the same breath that "he picked up a piece of marble as firm as when it was quarried," and that the marble building "stands erect, uninjured," and that "the façade has not a fissure in it." These statements are, in themselves, contradictory, and somewhat shake my confidence in the witness. It is rather hard to be told that we must not believe our own eyes; but scientific men do tell us that they are not sufficient, alone, in judging of facts, and that careful investigation is necessary before we even attempt to draw conclusions. But to my proposal. Most of the Boston correspondents of the London newspapers sent home descriptions of the fire. Can "E. G." give me the name and date of one in which this marble phenomenon is described? It must have been the subject of universal comment, and I should think could not escape mention. In asking this I am not doubting the *bona fides* of the statement of his friend across the Atlantic for a moment; but, only, that all the circumstances have been stated. Possibly, for example, the marble building was a residence with little furniture in it, and had special advantages for its salvation in an early and ample supply of water; while the adjacent granite buildings, on the contrary, were stores crammed with the most combustible materials.

Before closing, I may remark that a casing of Scotch granite, one-eighth of the thickness of a brick wall, which I propose, would be tolerably, if not perfectly, safe from destruction by fire. So far, all fires have shown brickwork to be the most enduring material, and as fires rage with the greatest energy inside buildings, my granite casing would, most likely, be amply protected. Moreover, London streets are wide, and public buildings are, in other respects, more or less fireproof.—I am, sir,

Upper Sydenham. H. Travis.

ORGANS IN CHURCHES.

Sir,—I think that it will not be a very great stretch of the imagination on my part to conclude, from the general tone of his letter, that your correspondent "X. X." is not a musician, and as my remarks on the position of the organ in modern churches were based on assumptions from a musical point of view, it is to the wrong person that I am now responding; but, nevertheless, I will, as he, endeavour to keep strictly to the subject. "X. X." says that it is "fair to presume that architects who have practised ecclesiastical design for some years, and thrown their whole energies in the pursuit, are more capable of forming an opinion architecturally and artistically of any fittings than an incumbent, or churchwarden, or an organ-builder." The energetic architects he alludes to may be able to advise as to the "fittings;" but if they continued to be energetic for centuries, at the end of their practice they might be as ignorant of music as when they commenced, and if architects are ignorant of music, and if the organ is an instrument that for its most effective display demands the result of musical study, why do not such architects take the advice of those competent and willing to give it—I allude to the organ-builders themselves" And why is the east end the "proper place for the organ and choir"? It is not necessary to face music to be in a position to hear it. I suggest to "X. X." that the organ being placed at the west end would afford good scope for artistic treatment. Let him imagine the organ at the west end in the centre, over, perhaps, the western entrance. boldly corbelled out, and with the soffit decorated on each side, galleries also projected out and richly corbelled; these galleries to contain respectively the soprano and alto, and tenor and bass choristers. Could not the congregation take part in the services quite as well as when the organ was buried in a chamber at the east end? And an advantage thereby gained would be that the organist would not be so exposed, for the pedal operations are by no means graceful. "X. X." speaks of "acoustics." What would he think of the man who, when playing a cornet, conveyed the music to his audience through the interstices of a basket? Some people would perhaps like the softened melody; but a natural deduction would be that the man was slightly deranged; and I maintain that the architect who orders the organ to be buried up in a chamber is more than slightly deranged. "X. X." does not quite understand my meaning when I speak of the organ having, by the treatment I alluded to, lost 30 or 40 per cent. of its value. Suppose that he bought a valuable musical-box, which was made to suit, as regards tone, a room of a certain size, and in which it would be heard to the very best advantage, and that he was compelled, by circumstances over which he had no control, to place this musical-box in an inner box of brick or stonework, would it or would it not lose any of its value, judging from effect produced?

I, as sincerely as "X. X." hope that this, to my mind, important question will be taken up by competent authorities, for it may lead to the discussion whether or not it is just for architects to control other architectural adjuncts about which the majority of them know as much as they do about the proper disposition of the organ.—I am, &c.

W. W.

THE OWNERSHIP OF DRAWINGS.

Sir,—I do not know under what circumstances Mr. Roger Smith is lecturing, but I presume he is addressing the younger members of the profession; if so I must protest against the advice he gives them with respect to the ownership of drawings. He says "If the client asked for the drawings they should be given him; but, as a rule, they should not be offered to him." Either the first advice is unwise or the second is dishonest. If the drawings are the property of the architect they should not be given up even if asked for; if they are the property of the client it is as dishonest to detain them as anything else he has paid for.

This, however, is another instance of a want of mutual confidence between the architect and his employer, both of which I had hoped the Institute would have cleared up. I refer to the vexed question of the supply of quantities. These are generally obtained from the measuring surveyor and charged to the builders. Why? Does it not look as if the architect was afraid of letting his employer know the expense of the assistance he is engaging, and if it were known that he would prefer escaping the 5 per cent. of the architect and the 2 per cent. of the surveyor by going to a builder direct for what he wants? Not that he gets what he wants; but surely the proper course is that when the quantities are supplied they be charged to the employer. It would often help to keep down estimates. At present the quantity surveyor, being paid by the builder, may be said to be in his employ, and, therefore, will naturally prefer his interests. Besides, the higher the amount of the bill the better he is paid, as his charge cannot be reduced with the building; on the contrary, any such reduction involves an additional fee.

But to return to the immediate subject of this letter: In what way or by what reason does an architect cease to hold a right over his drawings? A gentleman does not usually apply to an architect because he wants a set of drawings, but because he wishes for his professional assistance in building a house or other structure. The architect renders this by making sketches to explain his proposals to his employer and preparing working drawings to explain his intentions to the builder. He has as much right to retain his sketches as any other artist. An artist does not give up his preliminary sketches when paid for his finished picture, or a sculptor his clay model and plaster cast when he has completed his work in stone or marble. He has as much right to his working plans as the builder to the tools and plant by which he has been able to complete the structure.

It is possible for a considerable amount of work to be done without any drawings at all; the architect going to the building and advising with the contractor during its actual progress. I have more than once done this, and with satisfaction, at any rate, to myself. If, then, I prefer explaining my views and intentions by the medium of drawings it is an affair between me and the builder, with which the employer has absolutely nothing to do.

All this is, of course, apart from any special arrangement, whether made with the Government or an individual. A client may ask for a set of drawings, at the same time avowing that he has no immediate intention of building. Under such circumstances it is understood by both parties what is required and what is being paid for; but few architects of position would accept these terms, as the drawings might be entrusted to the builder or some incompetent person at whose hands the reputation of the inventor would in all probability suffer. But it is objected that in the event of the work not being done, what has a client to show for his money? Assuredly nothing, any more than were he to consult a physician as to his health but not adopt the treatment he advises; or to his lawyer for some tedious and difficult negotiation and he allowed it to drop through. What an architect is paid for is the employment of his time and the surrender of his skill, judgment, and experience. It is not his fault, but his employer's, if all are thrown away.—I am, &c.,

A. B.

DETAILS.

Sir,—Will you allow me to endorse the remarks of your correspondent, "E.," as regards details. We certainly see too little progress in the matter of original and useful architectural detail. I mean good building construction tastefully expressed, and practical.

This arises in a great measure from the reticence of architects themselves, who are apt to forget the real uses of publicity in developing and improving "the true artistic graces of æsthetic device," upon which Professor Kerr so earnestly insists.

Some time since you published excellent figured details to a good scale of Mr. Waterhouse's new building in Lincoln's Inn-fields clear enough to work from if required; though I need not say how impossible it would be for any one but the architect himself to deviate from them with safety, they are none the less valuable to every student, and we ought to be thankful when a gentleman so eminent as Mr. Waterhouse gives us really serviceable working drawings, and I am sure that such a contribution to the general welfare is the reverse of injurious to the author himself.

We want good examples of modern detail very much; applied to everyday wants and embodying recent improvements. Where are we to look for it if our leading men are reticent, and stow away good ideas on dusty shelves that ought to see the daylight?

Now and then we get fitful glimpses of useful detail at the rooms of the Institute and Association, but the show is too varied and soon over to do much lasting good.

Laxton's details are getting old, and will not last for ever. Will no one dare the perils of publication, and give us something really useful.—I am, &c.,

W. H. Lockwood.

10, John-street, Adelphi, W.C., Dec. 21.

MOUNTING DRAWINGS AND TRACINGS.

Sir,—The long-winded article on this subject which you extracted from the *Engineer* appears to me to render what ought to be a very simple operation both difficult and expensive. I am not a "mounter," nor accustomed to this work; but, some time ago, having a quantity of large tracings to mount, I proceeded as follows:—Attaching to the walls of a room (which, luckily for my purpose, were stained and varnished boarding) sufficient blind holland for the whole of the tracings, by means of tin tacks, I then well wetted the holland, and afterwards proceeded to paste the backs of tracings and affix them to the holland in precisely the same manner as a paper hanger or bill-sticker would do. I found this plan answered admirably. I required no help, and it was finished in a very short time, without a crease or a pucker. When dry, they were taken down whole, and separated as required. I consider it a mistake to have the holland in a horizontal position when mounting, and if varnished walls are not available, drawing-boards can easily be suspended. —I am, &c.,

Facilitas.

THE PRESENT POSITION OF ARCHITECTS' ASSISTANTS.

Sir,—Has the spasmodic wail ended? Have the mutineers thrown up the sponge in despair, and gone back to their present meagre fleshpots with a sigh? Do they forget that the chains of such mutineers are but riveted the stronger, that if the slave would be free he must strike on, strike ever? Every one must be aware that this is no question of paying for ability; the past and present "strikes" neither have been, nor are, actuated by any such motive, but by the sterner one of obtaining the three common essentials—bed, board, and washing. Assistants may rest assured that, so long as they lack the common sense and spirit to assert themselves, so long will the principals of the profession pocket the premiums with scanty thanks, let the fleeced ones pick up what crumbs they can during their four or five years' apprenticeship, and then generously allot them twenty white shillings per week as a sop for all their sorrows. We have looked in vain, for the last three weeks, for a manifestation of that shoulder-to-shoulder spirit that generally animates the oppressed. We read daily of meetings held by the "Amalgamated Society of Carpenters" and other trades, and now and then of the "Association of Engineers' Draughtsmen and Foremen;" but where, pray, is the "Association of Architects' Assistants"? Where, we wonder, its "local habitation"? Are we to continue to bend the knee in mute homage before the closed doors of the Royal Institute, and that aristocratic chip of the old block, the Architectural Association, and feed our mental and corporal man with the words of wisdom that emanate from each? We fear the honey that slowly leaks from these select institutions will do but little to clothe the minds or the physical bodies of poor assistants. Suppose they try for once what they themselves can do, and organise a society for mutual support and education, we feel sure hundreds would join it; and, if conducted in a spirit of manliness and brotherly love, would very soon improve, not only their worldly position, but, what is of far more consequence to themselves and their principals, their mental powers. There is but little good in grumbling in professional journals, even though they be as unbiassed and high-toned as the Building News: we must do as men do—act; and, in conclusion, we would counsel assistants to remember that, "if we assist ourselves, others will assist us; and if we respect ourselves, others will do likewise."—I am, &c.,

A Brother.

THE PROPOSED KNOX MEMORIAL AND "THE HEART OF MIDLOTHIAN."

Sir,—There is at present in Edinburgh such a great idea of doing something so grand, artistic, and costly in monumental honour to the memory of John Knox that the one only likely spot where such can for that purpose be effectively erected is likely to be neglected, at "The Heart of Midlothian," where almost every visitor expects to see some memorial to the Reformer near his grave, placed at the open space west of S. Giles' Church, where he last preached. May the historic heart of Midlothian be honoured as the site of this tardy testimonial to the memory of the champion of sound principle, by way of contrast to that memorial set up in the neighbouring square, seemingly at variance with all the cherished associations of the place, except the modern exterior of S. Giles and the Classic Law Court buildings, which may be supposed in keeping with the statue of Charles II.—

> . . . the King
> Whose word no man relied on,
> Who often said a foolish thing
> But never did a wise one.

Strange anomaly to visitors that this is the only votive memorial near the lowly grave of Knox. Surely, no huge tower, however grand, on any site could vie with an artistic memorial gem of Mediæval design placed near S. Giles in the shape of a bronze canopied statue of Knox on a pedestal of granite, with statues of the good Regent Murray, George Wishart, George Buchanan, or placed around the base of the monument.—I am, &c.,

J. K.

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CHIPS.

The Receivership of the Northern Estates of the Crown, vacated by the decease of Mr. Higgins, has been conferred upon Mr. E. J. Smith, of Whitehall-place, Vice-President of the Institute of Surveyors.

Bronwylfa Hall, Rhosllerchrugog, the new seat of Mr. Evans, of Liverpool, has just been completed, from a design by Mr. Clark, architect, of Liverpool; Mr. Ludlow, of Liverpool, being clerk of the works.

Mr. G. W. Reid, Keeper of Prints and Drawings in the British Museum, has nearly finished "A History of the Print-Room of the British Museum, with Some Accounts of its Contents and Keepers," with illustrations.

Signor Grattoni, the well-known Italian engineer, and one of the contractors for the Mont Cenis railway, is seriously ill.

Dr. Gray has lately presented to the British Museum a large picture of the temporary room, built for the reception of the marbles of the Parthenon, painted by Mr. Archer in 1819.

Intercommunication.

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QUESTIONS.

[2733.]—**Chimney Stacks.**—Will any of your many practical readers inform me the proper size of a chimney stack (say 200ft. high) to carry smoke from three boilers 24ft. long by 7ft. diameter? My own idea is (say) 5·6in diameter at top and 15·6in. at bottom, built thus: Dividing the height by 4 into portions of 50ft., the first 50 with 25in., the second 50 with 20in., the third 50 with 15in., and the fourth 50 with 10in. walls.—A Constant Reader.

[2734.]—**Price of Joiner's Work.**—Will any one please inform me whether there is a book published giving an account of what joiner's work should cost (labour only, exclusive of fixing), at the London rate of wages?—Gosport.

[2735.]—**Fixing Glass Letters on Glass.**—Would some one practically informed tell me the best cement to be used for this purpose, and also the best way, or a good way, of doing the work in a workmanlike manner?—O. B. D.

[2736.]—**Polishing White Wood.**—Will some one inform me of the *modus operandi* of polishing white wood, such as lime and apple, and could he also at the same time give me a recipe for white varnish?—S. C.

[2737.]—**Darkening Walnut.**—Would any one inform me how I may darken solid walnut? I want it so as to leave the grain of the wood quite clear, but darker.—S. P.

[2738.]—**Colours for Paper Stainers.**—I should be obliged if some one would inform me of the names of manufacturers who supply these.—James Hillyard.

[2739.]—**Steam Power for Street Tramways.** Can any one inform me whether steam has yet been used to propel cars on street tramways? If so, where?—S. T. C.

REPLIES.

[2729.]—**Villa by J. K. James.**—One chimney breast rests upon the wall between butler's pantry and serving lobby, the other on the strong beam which carries the wall, the lines of which should have been dotted on plan.—J. King James.

[2731.]—**Best Work on Cemetery Memorials.**—A good work on cemetery memorials is published by Cox & Son, 25, Southampton-street, Strand, price 6d.—G. A. H.

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LEGAL INTELLIGENCE.

The Master Builders and the London Carpenters.—It will be recollected that one of the clauses in the agreement signed between the Master Builders' Association and the carpenters and joiners, in October last, expressed that 8½d. per hour should be the standard rate of wages for skilled men in London. A case came before the judge in the Southwark County Court last Saturday, in which a joiner, named Jepps, sued a master builder of the name of Jocelyn for 1s. 7d., being the balance between 8d. and 8½d. per hour for 39 hours' work. The defendant pleaded that he had several men working for him at ½d. per hour less than the standard rate of wages, and further declared that he was not bound by the agreement with respect to the advance in wages, as he was no party to it. The judge said no master builder could plead ignorance of the agreement, and if he wished men to work for him for 8d. or 7d. per hour he must make a special agreement to that effect. As there was no agreement of that nature with the plaintiff he should give judgment for the amount claimed, with costs, in all 7s. 1d.

Action against a Builder.—Ruddock *v.* Rolph. In this case (heard in the Bloomsbury County Court on the 18th inst., before the judge, Lake Russell, Esq.) the plaintiff, a publican, sought to recover £35 11s. 9d. for a breach of contract alleged to have been committed by the defendant, a builder, of 23, Upper Baker-street, W. The plaintiff was the owner of a lodging-house, 7, Seymour-place West, and he contracted with the defendant, by specification, to do certain repairs and alterations in the house, the price agreed upon being £125. The defendant did some portion of the work, and received on account £105, the plaintiff not knowing the precise amount of work done. The defendant then suddenly, without giving any reason, withdrew his men from the work, and did not complete his contract. A surveyor was then called in by the plaintiff, who estimated the amount of work done by the defendant at £69 8s. 2d. The action was brought to recover the sum of £35 odd which had been overpaid. Mr. Furnish, a surveyor, and Mr. Barker, a builder, gave evidence in support of the plaintiff's case. The defendant said he had agreed with the plaintiff to do the work on condition that the whole of the tenants left the place. The promise of the plaintiff that the tenants should quit the place was not fulfilled, and the defendant, therefore, gave notice to the plaintiff that unless he complied with the terms of the agreement he should throw up the contract, as the tenants in the houses retarded the workmen and injured the work when done. He had done extra work not in the specification, for which he claimed about £14. Mr. Chippendale, a surveyor, said his valuation of the work done by the defendant was considerably above Mr. Furnish's estimate. His Honour thought the plaintiff was only entitled to recover £14 5s., for which amount he gave judgment.

Important Case under the Metropolitan Building Act.—An important case affecting the mode in which the owners of property are entitled to enclose it was heard at the Marylebone Police-court on the 16th inst., before Mr. D'Eyncourt. The Vestry of Marylebone sought to compel Mr. Bishop, an owner of property in Queen's-road, S. John's-wood, to remove a wall which he had constructed round a portion of his property. Mr. Greenwell, the Vestry Clerk, in opening the case for the parish, said that a summons was heard before Mr. D'Eyncourt last year in respect to building certain shops in Queen's-road, S. John's-wood, next the Marlborough-road railway station, beyond the line of frontage, and he (the magistrate) then granted an order to demolish so much of such buildings as were before the line set out by the Superintending Architect to the Metropolitan Board of Works, being 21ft. 6in. from the pavement, and that order having been complied with by the shops being built within the general line approved of by the magistrate, no complaint arose as to them; but defendant had erected at the east end of the shops a structure or wall 11ft. 8in. in height, and 11ft. 6in. beyond the prescribed line, but upon his own ground, which obscured the prospects from the adjoining villa and destroyed the uniformity of the road; the structure might itself be called a wall only, but it was evidently constructed with an ulterior object.—Mr. Bishop, the defendant, stated that the wall was not a building, and that he considered it only a fence wall, the same as all the houses in Queen's-road had surrounding their property, the only difference being that it was rather higher.—Mr. Browning, the surveyor to the Vestry, was examined, and said that he had served notice on Mr. Bishop not to continue the building of the wall; but it had been completed in spite of such notice; that the walls enclosing the property in the same road were about 5ft. in height, and not at all resembling the structure in question.—Mr. Snowdon, the occupant of the villa adjoining the property, gave evidence of the injury occasioned by the wall, and as to the description of dwarf walls generally enclosing the gardens in the locality.—The magistrate, after reading the Act, said the question was whether a person had not a right to enclose his own property by a wall, and of the same character as the garden walls in the road except as to height, but he was inclined to order the demolition of so much of the wall as would leave about 5ft., which would bring it to about the same height as the adjoining wall.—Mr. Greenwell submitted that the Act of Parliament required that the order should be to demolish the whole structure.—After much argument as to the construction of the Act of Parliament and the particular purpose for which the structure erected could be devoted and was intended to serve hereafter, Mr. D'Eyncourt told Mr. Bishop he must decide against him, and sign an order to demolish so much of the wall as projected beyond the line of frontage within six weeks' time. He would, however, grant a case for the Queen's Bench if Mr. Bishop upon consideration should desire to proceed further.

Disputed Contract for Girders.—In the Court of Queen's Bench, on Saturday, before Mr. Justice Archibald and a special jury, Bergheim *v.* The Darleston Iron Bridge Company, Limited, was tried. This was an action to recover the difference between the contract price and the sum actually paid for a number of iron girders to be used in the building of the Manchester new Town Hall. The defendants denied their liability. The plaintiff was an iron merchant in London, and the defendants carry on business in Shropshire. In June, 1871, the defendants entered into a contract to supply the plaintiff with the wrought-iron girders required in the building of the Manchester new Town Hall at £12 15s. per ton. Iron had risen since very considerably; and as the works at Manchester were at a stand for the want of the wrought-iron girders, the plaintiff had been obliged to procure them elsewhere at a cost of £24 per ton, and it was for the difference between the two prices that this action was brought. The defence was that there was no specified time as to the delivery, and the question for the jury was whether the girders had been delivered within a proper and reasonable time.—Mr. Sherlock, the managing director of the works, stated that from December last up to the present time he had had great difficulty to contend with in reference to obtaining labour, and there had also been strikes in the iron districts. The learned Judge said such evidence could not be received. It was no answer to the action.—Mr. Murphy proposed to use it to show that the goods were being supplied in a reasonable time, having regard to the then state of the trade.—The Judge said the difficulties which an employer had with his men in consequence of strikes was no answer to an action like this.—Mr. Murphy said that if the girders were to be provided by a certain time there would have been the usual clause in the contract providing against strikes.—The Judge said that evidence could not be received.—The witness stated that in the course of the correspondence he mentioned £4 per ton as the increased price, but he not make it a condition for the delivery of the girders. He was prepared to deliver them as early as they were delivered by the Horsley Company, who afterwards supplied them; but they were unable, from the then state of the labour market, to supply them before the 1st August last, when the plaintiff refused delivery. In fact at that time they were ready. It was then contended that if the plaintiff could recover, he could only obtain the difference in value from the 1st of August, and not between the contract price and that afterwards paid. The jury returned a verdict for the plaintiff—damages, £250.

Smethurst *v.* Beckett.—This was an action heard in the Court of Common Pleas on the 17th inst., before Mr. Justice Grove and a common jury, to recover a sum of money said to have been received by the defendant to the plaintiff's use. The case for the plaintiff was that he, in connection with Mr Lacy, was engaged by a Mr. Hodges to build in Ludgate-circus, and the defendant, an auctionee and estate agent, was employed in the same matt The defendant employed the plaintiff to erect up the site of the proposed buildings seats to view th royal procession to S. Paul's on Thanksgiving Day The seats were let in defendant's name, and he paid for their erection. Subsequently he was employed by the plaintiff to sell the materials, and it was to recover the price of them that the action was brought. The defence was that the defendant had throughout acted only as the agent of Mr. Hodges, and had incurred no personal responsibility. He was acting for Mr. Hodges when he employed the plaintiff to put up the seats, and it was by Mr. Hodges' direction that he afterwards sold the materials. It was true that the erection was christened "Beckett's Grand Stand," but this was because Mr. Hodges did not wish his own name to appear. The jury found for the plaintiff for the amount claimed—£84 4s.

Thames Embankment Compensation Claim.—Rosher *v.* the Metropolitan Board of Works.—This case, tried at the Sheriffs' Cou Red Lion-square, before Mr. Under-Sheriff Burch and a special jury, on the 19th inst., was a comp sation claim by Messrs. Rosher, cement merchants, &c., Cheyne-walk, Chelsea, for their premises required by the Metropolitan Board of Works. The claim in the proceedings was stated at £16,741 3s. A special jury was empanelled, and proceeded to Chelsea to take a personal view of the property to be taken for the Thames Embankment. On their return, Mr. Hawkins asked for a little time to consult, as some days might be saved by an arrangement. Counsel and surveyors on both sides conferred together as to the amount to be given. Mr. Hawkins informed the Court and jury that he was happy to say that a long investigation had been spared. A verdict for £8,001 would be recorded. Mr. Under-Sheriff Burchell directed the jury to return a verdict for the sum agreed upon by the learned counsel. A verdict was accorded for £8,001, and it was understood that the additional £1 was awarded in order to carry costs to the claimants.

Vice-Chancellors' Court.—The Marquis of Salisbury v. the Metropolitan Board of Works—the Metropolitan Board of Works v. the Marquis of Salisbury.—The hearing of these cross-suits was commenced on Monday week concluded on Tuesday. The bill in the first suit prayed an injunction to restrain the defendants in it from continuing to obstruct the Marquis, his lessees, and tenants of houses and premises in Cecil-street and Salisbury-street respectively from full and free rights of communication and acces and egress at all times to and from the land reclaimed and enclosed by the defendants under the provisions of the Thames Embankment Act, 1862, and, in particular, to and from the Embankment roadway; that the defendants might be decreed to provide and construct such convenient means of communication as by section 62 of that Act was required to be provided and constructed by them; for damages, and further relief. The bill in the second suit prayed an injunction to restrain the Marquis from prosecuting an action at law, commenced by him against the Board, for recovering a sum of £10,645 1s. 11d., and from commencing any other action for the same sum, or any part thereof, or otherwise concerning the matters in that bill mentioned. The substantial object of the Marquis's suit was to compel the Board to construct a carriage-road between the roadway of the Embankment and the land, called the low-level land, at the bottom of Cecil and Salisbury-streets. The land lies between two lanes—Ivy-bridge-lane and Cartney-lane—and is considerably below the level of the adjoining streets. In former times it had communicated with a wharf, and a public-house and a number of houses were built on it. The wharf had been swallowed up by the Thames Embankment, and the houses and land now lie between the bottom of Salisbury and Cecil-streets on the one side, and the Embankment on the other. That part of the Embankment has been laid out as a garden, surrounded by railings, and with gates which are locked at night; and it was across that garden that the Marquis wished to compel the Board to make the road in question. In the course of the dispute which arose between the parties, a reference was made to Mr. Horsey, as arbitrator, to assess the damage done to the Marquis's ty by the works of the Board, and in May, Mr. Horsey awarded the sum of £10,645 1s. 11d. compensation for the injury done to the inheritce of the property. That sum was to be ultimately alt with by this Court, and was apportioned thus—,875 for such injury, and £1,770 1s. 11d. for inrest thereon. The Marquis insisted that that ard did not include the carriage access which, by 62nd section of the Act of 1862, the Board was and to provide, and contended that the question such carriage access being provided for never was operly before the arbitrator. The Board, on the her hand, argued that the compensation awarded ould not have been so great had not all the claims the Marquis been regarded by the umpire. The Iarquis then sued the Board at law for the money, nd they paid it into court. On the 19th of January ast the Marquis moved for an injunction in the erms of the prayer of his bill, which was refused, rincipally on the ground that the Marquis's right to pended on the proper construction of the 62nd secf the Act of 1862, and that that was a matter for earing of the suits.—Mr. Eddis, Q.C., and Mr. W. Karslake appeared for the Marquis; Mr. ene, Q.C., and Mr. C. Hall appeared for the ropolitan Board of Works. They insisted that Marquis could not sue both at law for the money here for the roadway; that he had no right in carriage-way; but if he had, his action at law st be stopped.—The Vice-Chancellor said, after the est reconsideration of this case, he retained the pinion expressed by him on the motion for the njunction—viz., that the right of access reserved y the trustees was intended to be for the tenants of e houses in Cecil and Salisbury streets respectively, nd not the occupiers of the Marquis's property enerally. The means of communication to be proided were for those owners and occupiers only, hich was an important consideration in the contruction of the latter part of the section. With spect to that it was necessary to advert to the state f things before that Act was passed. The words f it were, no doubt, vague and undefined enough to pply to a footway or a roadway. But the position things prior to the Act of 1862 was regulated by e Act of George III., and a plan which had been rerred to in the arguments. Looking at those, it could ot be said that in 1862 the owners and occupiers f houses in Cecil-street and Salisbury-street had ny claim to a wheelway to the road to be made, nd the 62nd section of the Act of 1862 did not increase their existing rights. On the whole case, he hought the Marquis was wrong, and the Board ight, in their contention. But the Marquis might esire to appeal, and to enable him to do so as soon s possible, the decree should be (and on the two uits it was finally taken) as follows:—Declared that he right of communication, access, and egress, by he 62nd section of 25 and 26 Vic., cap. 93, reserved o the Marquis of Salisbury, his heirs and assigns, nd his and their lessees and tenants of houses and remises in Cecil-street and Salisbury-street respecively, with right of communication, access, and gress repectively, for foot-passengers only; then, aving regard to that declaration, decree in terms of he second paragraph of the prayer of the Marquis's bill, with liberty to apply, and the costs of the suit p to the hearing to be paid by the Marquis. The Court also directed the second suit to be stayed, and he £10,645 1s. 11d. to be returned to the Board of Works.

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STATUES, MEMORIALS, &c.

Swaffham.—The inhabitants of Swaffham have ust erected a tomb, near the north gates of the hurchyard, in memory of the late vicar. The tomb s of Portland stone, in several pieces, the design eing furnished by Mr. Phipson, of Norwich. On he plinth rests a slab 10in. in thickness, on the edge f which, which is bevelled, is an inscription. On the ides are representations of various flowers, carved by Mr. Barrett, of Norwich. These flowers number ixty-four in all, namely, twenty-three on each side, nd eight on either end. Above this stone is another, haped out, with a cross roll at the top. The tomb is urrounded by an iron railing. The work has been xecuted by Mr. James Heyhoe, of Swaffham.

The Brunel Testimonial.—The Brunel Testimonial Committee, whose purpose it is to erect a memorial statue in honour of the designer of the Great Eastern, have submitted various designs to the Board of Works for the erection in the Gardens at the east end of the Temple-station. The consideration of these has been placed in the hands of he Engineer of the Board, who reported to the Works Committee, who now recommend that the Brunel Testimonial Committee be permitted to erect pedestal of the ordinary character, without a screen, for the statue of the late Mr. Brunel, the esign for such pedestal being previously submitted o the Board for approval.

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Mr. Edward Armitage was on Monday night lected a Royal Academician in the place of Mr. H. R. Pickersgill, lately retired. Mr. J. Durham, A.R.A., was next to Mr. Armitage in the ballot. The election for Associates will take place in anuary.

Our Office Table.

Tile Pavements.—Mr. Henry C. Webb, of Rainbow-hill, Worcester, has forwarded to us a copy of his new pattern-book and a sheet of designs, together with some specimens of the tiles themselves. The arrangement of the pattern-book and sheet is neat and artistic, calculated to afford to purchasers a comprehensive means of selection in the choice of designs, many of which are novel and good. For the convenience of customers, Mr. Webb has adopted one standard price for all—5s. 6d. per superficial yard. The sample tiles are excellent both in quality and colour. By the use of a little six-sided box, which holds five miniature tiles, Mr. Webb is able to send his samples anywhere through the post for two stamps, and architects and builders will do well to avail themselves of this facility.

Cleopatra's Needle.—Mr. John Dixon writes:—"The removal of this fine obelisk from Alexandria, and its erection on the Thames Embankment, has lately been mooted. I have just returned from Egypt, where I am constructing an iron bridge across the Nile, and I had the curiosity when there carefully to examine the position of the monolith, and to survey the adjoining foreshore. I need not trouble you with the details, but simply give you the result of my estimate, as a guide to those interesting themselves in the matter. There are no difficulties in the way, and the obelisk may be shipped, brought to England, and erected on the Embankment for £15,000—not a great sum for the acquisition of so ancient a monument."

New York Exhibition of Sketches of all Nations.—Arrangements have been made to hold an International Exhibition of sketches and water-colour drawings, in New York, on the 1st February next year, under the control of the Council of the National Academy, and it is proposed that it should be held annually. The council of the National Academy have agreed to the proposals made at the request of numerous artists in England, and are now prepared to receive any works of merit, either water-coloured drawings of sketches in black and white, to be exhibited simultaneously with their own works, the Council having courteously placed at the disposal of British and foreign exhibitors for that purpose some of the best rooms in the new National Academy. The Council have undertaken the charge of all works sent for exhibition, as well as the transaction of any business connected with them. No pictures can be received in London for transmission to New York after the 1st proximo.

A Sewer on Fire.—On Friday last at the meeting of the Vestry of S. George's-in-the-East, the surveyor reported that on the 16th inst. he sent a man named Gooch into the Cable-street sewer for the purpose of discovering the cause of the stoppage of a drain. The man had just entered the sewer when he was heard to cry out, and the surveyor, fearing something wrong, sent another man down. The latter directly called out that the sewer was on fire, and further assistance was obtained. Gooch was dragged out severely burnt. The necessary measures were then taken and the fire was extinguished. It appeared that immediately the man entered the sewer he was surrounded with flame, and, crying out as loud as he could for assistance, he, with great presence of mind, dashed the lamp which he was carrying into the water and flung himself down upon his face. This doubtless saved his life. From the strong smell of petroleum, the surveyor was led to examine the premises of Messrs. Pinchin & Johnson, oil refiners, which are close to the scene of the accident. He there found that two petroleum tanks had been leaking unobserved into the drain, and the petroleum had thus found its way into the sewer. The surveyor thereupon directed that receivers should be constructed under the tanks, and made other arrangements to prevent the recurrence of a similar accident.

Tumuli Explorations in Ayrshire.—On Tuesday night, Mr. J. S. Phené, of London, delivered a lecture in Paisley, under the auspices of the Philosophical Institution, the subject being entitled "Records of the Past." Mr. Phene, in the course of his remarks, drew attention to a remarkable monument he had just discovered in Ayrshire, on the estates of the Earl of Eglinton and Winton, near Skelmorlie Castle, the residence of Mr. John Graham, who had erected it in connection with the old feudal fortress of the Montgomeries. Near this castle is a remarkable mound, with a long serpentine embankment, the two being now severed by a roadway, and on this mound, which is partly natural and partly artificial, he had discovered, in the course of excavations, under a thick deposit of vegetable mould, the evident growth of centuries, a paved platform in the shape of a segment of a circle; and, curiously enough, just covering that space in the points of the compass that the sun would never reach in this latitude on the longest summer's day, an evidence, he considered, of solar rites, either by completion of the solar fiery circle, at that time of the year when it was only deficient to the extent filled by the platform, or to propitiate, or guard against the power of evil, whose abode was attributed by the magi to that part of the universe the sun never visited—the north. The platform was 80ft. long, and 5ft. wide, extended from north-east to north-west, and showed evidences of an extensive burning. It was so screened, both to sea and landward, as evidently not to have been used as a beacon. Other discoveries on the Earl of Eglinton's estate had been made. Amongst the ashes and charcoal, on careful washing, were found quantities of small fragments of calcined bones, which seemed to him to imply a place of sacrifice.

The Architect to the Edinburgh Improvement Trust.—At a meeting of the Edinburgh Improvement Trustees on Friday last, an attempt was made to resist the re-appointment of the two architects to the Trust. Bailie Lewis said that in the present circumstances of the Trust it was extreme folly to continue to employ two architects. Any gentleman conversant with the work done during the last two years, and more especially the past year, would at once see that it was a wanton waste of money to employ two architects, at £300 a-year each. He thought it was perfectly obvious that they could get on very well with one architect, and he moved that only one be now appointed, at a salary of £300 a year. Mr. Gowans said the Trust had at present two gentlemen familiar with the work they had on hand, and considering what there was to do in regard to Adam-square and Chambers-street, he thought there would be no saving in dispensing with one of them. He proposed that Messrs. Cousin & Lessels be reappointed architects to the Trust. A division being first taken on Mr. Gowans' amendment, it was negatived by 17 to 8, two trustees declining to vote. On a further division a remit was made to the Works Committee to reconsider the matter.

The Public Health Act.—At a conference held at Norwich on Saturday, a scheme was submitted for the appointment of medical officers of health and inspectors of nuisances, under the Public Health Act. Lord Kimberley, who was present, remarked that in order to secure the services of thoroughly competent men, large areas were indispensable. One of the evils which the country suffered was the infinite multiplication of authorities for government purposes.

Chinese Skilled Labour.—In a book lately published by the Consul of Shanghai, he says that the Chinese are peculiarly fit for competing in the great labour market of the world. They are good agriculturists, mechanics, labourers, and sailors, and they possess all the intelligence, delicacy of touch, and unwearying patience which are necessary to render them the first machinists and manufacturers, and that they, as a nation, are worthy of the serious attention of both employers and workmen in these days of strikes in every department of British skill and industry.

Budget of the Board of Works.—The Metropolitan Board of Works was on Friday last chiefly occupied in considering the financial statement for 1873, introduced in an elaborate speech by the chairman of the Finance Committee, Mr. Dresser-Rogers. The total net charge estimated for the coming year is £232,562, which is equivalent to a rate of under $2\frac{3}{4}$d. in the pound on the present rental of the metropolis £20,367,298. Last year the total net charge was £223,251, equal to a rate of 2·68d. in the pound on the rental (then £19,271,981). The increase is mainly under certain heads of the working expenditure of the Board. There is a considerable increase under the head of sewerage and drainage, traceable, no doubt, to the augmentation of wages. The lighting and maintenance of the Thames Embankment being now undertaken by the Board, accounts for an additional outlay of nearly £3,000; and the charge for the supervision, &c., of parks and open spaces is also increasing, as more ground is being acquired for the public benefit. The working expenses of the fire brigade are estimated at £155,218, or £4,886 more than the expenditure of 1872—an increase mainly caused by the recently-granted increase of the firemen's pay.

Varieties of Turpentine.—There are four sorts of turpentine,: Venice turpentine exudes from the larch—strong smell, hot, disagreeable taste; the Chian or Cyprus turpentine, pistachio tree, a fragrant smell, a bitterish pungent taste; Strasburg turpentine, an agreeable aromatic odour, uncommonly bitter taste, very clear; common turpentine from the spruce fir, disagreeable odour and taste.

WASTE OF PAPER.—The *Publishers' Circular*, referring to the inadequate supply of material for making good paper, says:—"Some saving might be made, since we shall be forced to economise, in letter and note paper. Why should not society submit to allow it to be proper and fashionable to send only one leaf or half a sheet of note or letter paper, since, in seven cases out of ten, letters are written on one side only? 'Paper-sparing Pope' set a very good example more than a century and a half ago in writing his poems, and even his letters to noblemen and gentlemen, on the blank half-sheets torn from the letters he had received; and, as may be seen by his MSS. in the British Museum, contrived to utilise the blank sides of the wrappers or envelopes of such letters. Would we had more paper-sparers among us!"

MR. RUSKIN AND HIS WORKING MEN.—In opening his *Fors Claveriga* for December, Mr. Ruskin writes:—"My friends,—I shall not call you so any more after this Christmas; first, because things have chanced to me of late which have made me too sulky to be friends with anybody; secondly, because in the two years during which I have been writing these letters, not one of you have sent me a friendly word of answer; lastly, because even if you were my friends, it would be waste print to call you so once a month. Nor shall I sign myself, faithfully yours, anymore, being far from faithfully my own, and having found most other people anything but faithfully mine. Nor shall I sign my name, for I never like the look of it, being, I apprehend, only short for 'rough skin' in the sense of 'pig-skin' (and indeed, the planet under which I was born, Saturn, has supreme power over pigs); nor can I find historical mention of any other form of the name, except one I made no reference to when it occurred, as that of the leading devil of four—red skin, blue skin, and I forget the skins of the other two—who performed in a religious play of the fourteenth century, which was nearly as comic as the religious earnestness of our own century. So that the letters will begin henceforward without address, and close without signature. You will probably know whom they come from, and *I* don't in the least care where they go to."

THE THAMES EMBANKMENT.—At the last meeting of the Metropolitan Board of Works, the Committee of Works stated, with reference to a letter that had been received from the Chelsea Vestry, asking the Board to continue the Embankment from Battersea Bridge to the camp-shedding opposite Cremorne Gardens, on the alternative conditions mentioned, that they saw no reason to depart from the opinion submitted to the Board on the 17th of May last—viz., that the Board would not be justified in continuing the Embankment as suggested.

IPSWICH.—At a recent meeting of the School Board, the chairman said he had had under consideration the rules issued by the Royal Institute of British Architects, which had been sent by Mr. Eyton, architect for Argyll-street School, in support of an application by him for payment to him of 5 per cent. upon the instalments paid to the builders, or half the commission on signing the contract and the remainder on the completion of the work. and it seemed that those rules supported the claim. The rules, however, were not in any way binding on the Board. It was agreed that £25, 5 per cent. on the instalment paid to the builder, be paid to Mr. Eyton.

SHEFFIELD.—The Unstone National Schools are now approaching completion, the work having been pushed on with much vigour by the contractors, Messrs Platts Brothers, masons, Dronfield, and Messrs Broomhead, joiners, Whittington Moor.—The proposed new national school at Coalaston, which will be a neat structure of stone, 20ft. by 40ft. with class-rooms, the cost being upwards of £400, will be commenced at an early date. The contractors are Mr. J. Tomlinson, mason, and Mr. James Bramhall, joiner, Dronfield.

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WATER SUPPLY AND SANITARY MATTERS.

ROTHERHAM.—At a special meeting of the Rotherham Town Council on the 18th inst., it was resolved, on the motion of the Mayor, "That all owners or occupiers of property within the borough of Rotherham do amend their system of drainage by having a gulley placed outside their premises, thus preventing the sewer gases from escaping inside their houses, the object being to make a severance between the sink stone and the sewer by means of such gulley." The Mayor said he had called a special meeting of the Council in consequence of what Dr. Hardwicke had told him about the imperfect state of the drainage in a great many of the houses he visited. In some of the houses where typhoid fever prevailed there was no trap between the sinkstone and the main sewer, and in many cases where there were traps they were so defective as to be utterly useless. The screws that were made for clearing out the traps were in some cases gone altogether, and there was, on the whole, sufficient cause to account for the fever in a great many of the houses where it prevailed. There were about 1,600 houses in the borough which directly communicated with the sewers from the sinkstone. Undoubtedly the typhoid fever prevailing in the town was caused by sewer gases, and not by the water, which, on analysis by Mr. Baker, of Sheffield, had been found very good and wholesome.

THE CONSTANT SUPPLY OF WATER FOR LONDON.—This desideratum, so long talked of, would appear to be as far off as ever. At a meeting of the S. Pancras Vestry on the 18th inst., the General Purposes Committee reported that they had further considered the regulations under the Metropolitan Water Act, 1871, and the communications from the Metropolitan Board of Works thereon, and they recommended that it be suggested to the Board that no further action should be taken by them on the subject until some amendment had been made in the Act, and in the regulations of the Board of Trade. The recommendation was adopted.

IPSWICH.—A very important report has just been addressed to the Ipswich Corporation by Professor Voelcker upon the sewerage of the town. The report summarily disposes of all the schemes that have been propounded for dealing with the sewerage problem in this town since the plan of Mr. Peter Bruff was submitted to the Corporation some fifteen years ago, and it seems probable that to Mr. Bruff's plan the authorities will have to go back at last. After some general remarks upon the most effectual plan of disposing of town sewage, Dr. Voelcker proceeds to give the results of an analysis of two samples of Ipswich sewage which had been sent to him.

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CHIPS.

On Wednesday, the 11th inst., the new Congregational Chapel at Sutton Valence was opened. The building has been erected from the design of Messrs. Sulman & Rhodes, architects, London, by Messrs. Wright Brothers & Co., contractors, Croydon. The design is simple Gothic; it is substantially built of Kentish rag stone with Bath stone facings, having a spire about 70ft. high, and will accommodate about 400 worshippers.

At a special Chapter held in the Deanery, Ely, on Wednesday, the 18th inst., Mr. R. Reynolds Rowe, F.S.A., architect, Cambridge, was appointed surveyor to the Dean and Chapter, and Mr. John Bacon, of Ely, was appointed clerk of works.

The new (Roman) Catholic schools in Lawson-street, Middlesbrough, are rapidly approaching completion. The plans were prepared by Messrs. Hunter & Carr, architects, of Middlesbrough; Mr. H. Hallgate is the builder.

Another statue, one of the works from Cyprus, says the *Athenæum*, has been placed in the hall at the British Museum, near the Assyrian bulls. The case for antiquities of this class is now filled with objects from the Laing collection, consisting of about a score of heads of statues, mostly of less than life size, and exhibiting considerable differences in execution and style, with a common manner.

The Paddington Vestry has decided to take into its own hands the scavenging and watering of the streets of the parish.

The three candidates presented by the Academie des Beaux Arts for the office of Directors of the School of Rome are MM. Lenepveu, Jouffroy, and Martinet.

Several of the pinnacles of Oriel College Chapel, and one of the pinnacles of S. John's College Chapel, Cambridge, were blown down during the late gales.

Mr. W. H. J. Weale, the well-known antiquary and writer on the archæology of art, is to describe, for the Science and Art Department, the Flemish pottery, seals, &c., in the South Kensington Museum.

The municipality of Terni have proposed to erect a monument to Tacitus in their city, and in 1875 the municipality of Certaldo intend to raise a monument in honour of Giovanni Boccaccio.

A new Congregational Church was opened on Sunday at Hamilton, N.B. The estimated cost of the building, which is a neat Continental Gothic structure, with accommodation for 362 sitters, is between £1,300 and £1,400.

The new hall in connection with the Melbourne Mechanics' Institute, or Athenæum, was opened by the Governor of Victoria on the 19th November. The hall will seat 1,000 persons comfortably, and, with the exception of the Town Hall, this is the largest in Melbourne or the suburbs. The cost of the works will be £7,000.

Mr. George Smith, the Assyriologist, is on his way to the East, for the purpose of making excavations at Nineveh.

The use of tinfoil for covering walls has been attracting some attention in France. In the *Revue Hebdomadaire de Chimie Scientifique et Industrielle* is an exhaustive paper, by Daniel & Co., "On the Use of Tinfoil Instead of Paper for Covering Walls, and on the Process of Applying Colours to that Material."

Trade News.

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WAGES MOVEMENT.

BIRMINGHAM.—A meeting of the master builde was held on Monday night, at the Acorn Hotel, Templ street, to take into consideration the notices receiv from the men asking for an alteration in the workir rules. The men, in these notices, demand an exte sive rise of wages, and the carpenters and joine require a reduction of hours as well. These are tl principal points, but there are details as to walkir hours, &c. At the meeting last night the mast builders agreed upon a new set of rules, which th will issue as a counter notice. The representatives both parties will meet to discuss the points at issu and in the event of their being unable to agree, tl dispute will be referred to arbitration.

DARWEN.—The quarrymen of Darwen have sent a demand to their masters for an advance of 3s. p week.

TENDERS.

ASTON FLAMVILLE.—For rebuilding the nave and tow of Aston Flamville Church, Leicestershire. Mr. Willia Smith, John-street, Adelphi, architect:—

Law & Sons (accepted)	£1235

BRUNTINGTHORPE.—For rebuilding the parish church Bruntingthorpe, Leicestershire. Mr. Wm. Smith, Joh street, Adelphi, architect:—

Loveday	£1856	14	2
Osborne Brothers	1762	0	0
Law & Sons	1724	8	6
Herbert	1654	0	0
Bennett	1582	0	0
Allen (accepted)	1580	0	0

CAMDEN TOWN.—For additions to the Brewery, Camd Town, for Messrs. Garrett. Mr. F. Peek, architect:—

Perry & Co.	£2200
Manley & Rogers	2177
Downs & Co.	2116
Newman & Mann	1876

HEREFORD.—For the erection of the Ross Board Schoo Hereford. Mr. G. Pearson, surveyor:—

Hawkins	£6900	0	0
Spring	6592	0	0
Edwards & Hine	5630	0	0
Kemp	5499	0	0
Jones & Son	5300	0	0
Meredith	5272	0	0
Griffiths	5270	0	0
Clutterbuck	4994	10	0
Everal	4984	0	0
Welsh	4970	0	0
Coleman Brothers	4931	0	0
Bowers	4697	0	0

KINGSWOOD WARREN.—For the erection of stable buil ings at Kingswood Warren, Surrey. Mr. William Smit John-street, Adelphi, architect:—

Rayment	£1520
Brown	1500
Manley & Rogers	1464
Wagner	1400
Potter & Ferrige (accepted)	1346

NEWPORT (Mon.).—For the erection of new schools Cwmbran, near Newport, Mon. Mr. Lansdowne, Ne port, architect:—

Jones	£3290
Parry & Son	2750
Bevan & Son	2570
Lindon	2400
Miles	2382
Parfitt	2250
Christopher (too late)	1872

SOUTH SHIELDS.—For fitting up the Free Librar Borough of South Shields, with pitch-pine book-case counters, &c., and altering and extending lavatory, w.c. &c. Mr. Matthew Hall, borough surveyor:—

	Library Fittings. £	Lavator &c. £
Suddards	285	95
Chapman	257	—
Scott & Co.	250	120
Nichol	235	118
Purvis	215	93*
Fisburn	209	105
Harwood	183*	110

* Accepted

WESTON-SUPER-MARE.—For new sewer from Claremor to Orchard-street, Weston-super-Mare, for the Drainag Committee:—

Ritson	£5440	0	0
Neave & Sons	4391	18	0
Harvey & Son	4250	0	0
Stradling & Son	3995	15	0
Merrywear	3825	0	0
Taylor	3245	0	0
Hando (accepted)	3150	0	0

WOLVERHAMPTON.—For erecting governor's house an porter's lodge, for the Board of Guardians:—

Nelson	£1140	0	0
Sansom	1085	0	0
Reans	1035	0	0
Gough	1026	0	0
Collins	1004	0	0
Groves (accepted)	969	3	0

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